THE

PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

EDITED BY

WILLIAM CROOKES, F.C.S.

VOLUME I.

"*Nulla recordanti lux est ingrata.*"—MARTIAL.

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THE PHOTOGRAPHIC NEWS.

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INTRODUCTORY ADDRESS.

The title we have chosen for this publication will, we hope, be sufficiently explicit to indicate our design; yet, in our first number, we feel anxious to explain as fully as possible the nature and scope of the "Photographic News."

Photography has undoubtedly attained to the dignity of a Science; and among the marvels of this age of discovery, there are perhaps none so great as those that are associated with this art. The pagan nations of antiquity worshipped the sun, whose genial warmth impregnated nature, and clothed the hills with verdure, flowers, and fruit; but we have learned a wiser lesson; we have scientifically utilised the object of pagan worship, and made his golden rays subservient to the purposes of an artificial life. Philosophers have yet to discover "What is electricity," though practical minds have already harnessed it to a girdle that encircles the globe, and bid it bear with lightning speed our thoughts and wants across vast continents and beneath intermediate seas. Its elements and attributes are not defined; but, nevertheless, its work is ascertained, and this mysterious agent is pressed into the service of mankind. So chemists have yet to analyse the sunbeam, and tell us accurately what it is; but practical philosophers have already made it a willing and obedient servant. It paints for them pictures instinct with life and beauty, and with a fidelity so true that art cannot imitate it. Thus does it conveys new lessons to the disciples of science, and inspires her votaries with purer and simpler tastes, and with loftier aspirations after proximate perfection. This faithful but somewhat capricious servant may now no longer resist the power of the human will, for Nièpce de St. Victor, the modern Laputan sage, has taught us how we may store the sunshine in our cellars, and in a moment release it from imprisonment, amid the profound darkness of the night, to fix with delicate and perfect accuracy a living memorial of endeared objects. Those wonderful agents, steam and electricity, readily obey the wand of the modern magician, and effect an immediate realisation of human desires; but no discovery can compare with this, the last and greatest acquisition that the bold hand of science has snatched from the secrets of nature. And yet new mines of undiscovered wealth invite the enterprising disciples of this, as of every other science. The exhaustless stores of nature are unfolded to us only as pressing wants urge on adventurous spirits to ransack her boundless resources.

To encourage and sustain such enterprise is the object contemplated in the establishment of the "Photographic News." We have carefully studied the subject, and are convinced that such an organ is imperatively necessary to meet a palpable demand.

The features which will distinguish the "Photographic News," and render it the most valuable medium of information, not only to professed photographists, but also to all who are interested in the development of science, will be—

I. Under the head "Notes and Queries," replies to correspondents who may seek information on photographic and other scientific subjects of a kindred nature.

II. Information, derived from foreign as well as domestic sources, of all discoveries and improvements in photography, optics, photographic chemistry, and other cognate sciences.

III. Elementary lessons in photography, together with a dictionary of photographic terms.

IV. Reviews of books on photography and its kindred sciences, and critical notes of exhibitions of photographs and other works of art.

V. Reports of the transactions of English and foreign photographic and other learned societies.

The "Photographic News," as the recognised organ of photography, will be the guide and instructor of the beginner, the medium of communication and interchange of ideas between more advanced students, and the record of all improvements and discoveries which may take place in the art, or in the allied sciences of optics and chemistry.

We will not dwell any longer upon the importance of the task that we have undertaken, but will address ourselves carefully to the work, relying on the generous indulgence, and on the liberal patronage of those whose interests we are endeavouring to promote and to secure. We are aware, that in undertaking to smooth the rough path of investigation and experiment, we accept serious responsibilities, but we are sustained by a firm reliance on the varied talent which has been placed at our disposal, and on the abundant resources that we possess. We do not, therefore, doubt our power of rendering our performances equal to our promises.

Optics.

HOW TO CHOOSE A LENS.

Mr Editor,—In commencing a series of short communications on the practice of photography suited to your periodical, a difficulty presents itself in the general arrangement of the subjects, owing to the importance, or rather necessity, of making each paper, as far as possible, complete in itself, as well as intelligible without continual reference to former ones. Especially must we provide against its being dependent upon those that are to follow. Perhaps this difficulty is best met by a subdivision of the various items to be treated of, taking each, firstly, in *its most simple form* or condition, and subsequently, and in succeeding chapters, dealing with the more complicated cases.

Adopting this course, at least for the present, and selecting *the choice of a lens* for a subject, let us proceed to consider the same in its most simple form, viz., where that choice lies between two or more lenses of *the same* (or very nearly the same) *focal length and aperture.*

Such a selection is not unusually the first difficulty of any importance which the tyro in photography encounters. Chemicals of good quality he can now readily procure in almost all localities; a camera, suited to his wants, with nearly the same facility; and even if the latter be a little rickety, he can use it *with tenderness;* or, should it be leaky (of light inwards), the chink may be stopped, or a cloth thrown over during work; while an indifferent lens can only be remedied by substituting another of better quality. To choose, therefore, in the beginning a good lens, or the best of several (the lower priced lenses, nominally the same, often differ exceedingly in quality), is important to the beginner.

To expect that the tyro in photography can adopt, with any certainty, the usual recommendations to choose his lenses by actual photographic trial, is to expect at his hands that for which long experience alone can qualify him. Fortunately there is a method little recognised, but more generally certain, and involving no necessity for previous photographic experience. Its correctness depends upon the fact, that all lenses producing good visual images are capable of producing good photographic ones; while lenses incapable of affording either are incapable as to both. This is of course to be understood in every case of equal apertures.

In the selecting of a lens from several of the same calibre, therefore, whether the party be a mere tyro or an adept, let him begin by examining their *visual* images, recollecting that the great aim of the photographer should be to select that lens which combines, what photographers usually term, a large field with the greatest distinctness throughout—the picture, visual or photographic, being assumed to be received or taken on a plane surface.

Now, should it so happen that in selecting a lens we can place the camera at a good distance (say fifty times or more the focus of the lens), and directly opposite to a long and even line of buildings, an important object will be gained. Such a subject is, however, of rare attainment, and can be altogether dispensed with by proceeding as follows:—

Procure, with the lenses to be examined, two cameras, and attaching to each of these one of the lenses, place one of the cameras on a tolerably level surface (a table for instance), and over it the second camera; draw one vertical and central line with a pencil on the greyed glass of each camera, and bring the image of any small, well-defined, and well-lighted object, not too near (twenty times the focal length of the lenses will be sufficiently far), to coincide with the lines marked on the glass, and carefully adjust each camera to the best focus for the selected object; then, turning both cameras, *by laying hold of the under one*, cause the images to pass from the centre of the field to any desired distance right or left in both cameras (taking special care that no disturbance of the upper or under camera occurs). Observe the relative indistinctness thus produced. If a difference exists, such will of course be more apparent as the images are caused to recede from the centre of the field; and should it be required to compare more than two lenses, then, retaining the better of the first pair, proceed to try a third lens with it, and so on.

Should the second camera not be procurable, proceed as follows:—Draw three vertical lines on the greyed surface; one central, the others near the extremes of the field, and equidistant from the centre; adjust the focus carefully as before, the image of the selected object being at the centre line. Mark the then position of the lens in the tube in which it slides. Turn the camera (keeping the lens, if the object be rather close, over nearly the same part of the table) until the image is brought to one of the lateral lines marked on the greyed surface. Adjust the focus again, and mark the new position of the lens in the sliding tube. Take, for accuracy's sake, a mean of several such focusings, using at one time the position to the right, and at another to the left of the central one (for the lateral images are usually uncertain to focus for, especially in view lenses). The distance between the two marks so obtained, is the measure of the departure of the lens from a flat field for the distance between the central and lateral lines marked on the greyed surface; and, this being noted, the same process is to be repeated for each lens to be examined; and that lens of the series which differs least in the so measured foci of its central and lateral pencils, is to be selected as giving the flattest field; and, should it give an equally distinct image at the centre of the field as the others, is decidedly to be preferred.

In concluding, it may be observed, that the foregoing method of trial has the following advantages:—1st. Of simplicity. 2nd. Of being available to all, and under all circumstances, even at night in a long room. 3rd. Of requiring neither previous practice in photography, nor any apparatus, save that of the camera itself. 4th. As testing those defects which are most likely to be met with in excess both in the portrait and landscape lens. And, lastly, that the method of trial is such as to remove all difficulty and uncertainty as to the angle of the field for which we are testing the lenses now under trial—the trials being understood to be comparative ones, and the angles, under which the lenses are tested being, whether the two cameras, or but one such are used, identical.

V.

THE STEREOMONOSCOPE.*

BY M. A. CLAUDET.

On examining the image of the camera obscura on the ground glass, one is much struck with the beauty and perfection of that representation of natural objects; but when the very same image is fixed on a photographic surface, one is disappointed to find it very inferior to the image made on the ground glass.

It is only when the photographic image, being rendered binocular, produces the stereoscopic effect, that it seems (with the exception of colour) to equal in perfection the image on ground glass.

What is the cause of this effect? It would indeed be extraordinary if we found it were the same in both cases. But how are we to believe that when both eyes behold on the ground glass that which appears to be one single impression, this *single* image is capable of giving an appearance of relief similar to that which the visual coincidence of two distinct and separate images (each having a different perspective) presents in the stereoscope? This would be indeed a phenomenon, of which, at first sight, reasoning from the recognised principles of science, no one would suppose the possibility.

But sometimes a fact, which has hitherto escaped observation, demonstrates the possibility of the existence of a phenomenon that, but for this fact, would for ever have remained unexplained and inadmissible.

Thus, in the course of my investigations, an unexpected and extraordinary fact has presented itself, of which I have made such deductions as have enabled me to arrive at truth.

There was no denying the evidences resulting from the examination of images on ground glass. Eyes, accustomed to compare an image in relief and one without relief, could not be deceived upon such characteristic effects, nor could they mistake the one for the other.

An attentive examination of this image, as well as actual experiments, proved to me, in the most unquestionable manner, that the image *was* in relief.

Now, as this phenomenon could not exist in violation of the laws of binocular vision, I began to consider whether the ground glass might not communicate to each eye the impression of a different perspective; for I knew very well, that when this is not the case, no illusion of relief can be produced. I then began to examine in what manner the rays formed the image in the focus of the camera obscura after having been refracted by the lens; and I also considered what properties the image acquires when it comes in contact with ground glass.

The result of my labours has been the discovery of a remarkable fact, and one which I believe had never been observed before.

When we behold, on the ground glass of the camera obscura, the impression of a solid, produced by the full aperture of the lens, we perceive, in looking at it with both eyes, that the image is stereoscopic; but if we behold it with one eye only, it offers none of the peculiarities of relief.

The stereoscopic effect is produced in all its beauty upon a clump of trees in close proximity to one another. If one is making experiments in a photographer's atelier, one obtains the most remarkable effects of relief by looking at the reflection of objects placed on surfaces entirely distinct from each other.

The focimeter is very useful for this purpose. The focimeter is an instrument which serves to point out the difference between the visual and chemical foci in achromatic lenses. It consists of a white disc covered with black figures, and is divided into eight sectors, fixed at equal distances around a horizontal cylinder, of 12 inches in length. This instrument is raised on a stand. Although the sectors are 1½ inches apart, and the distance from the first to the eighth is 12 inches, if the apparatus is placed before the camera obscura in such a manner as to enable all the sectors to present their surfaces perpendicularly to the axis of the lens, the image formed on the ground glass represents one complete disc.

If with both eyes we examine the image of this disc on the ground glass, we distinctly see all its sectors as distinct, one from the other, as when we look at the focimeter out of the camera obscura. The effect is perfectly stereoscopic, but it becomes pseudoscopic, that is to say, the order of the planes is inverted (the nearest sector appears the most distant, and the most distant appears the nearest), if we make use of the pseudoscope, just the same as if we looked at the focimeter (out of the camera obscura) with a pseudoscope.

The stereoscopic and pseudoscopic effects only become manifest when both eyes are at about an equal distance from the centre of the image, say each at an angle of six degrees.

But if we close either eye, or, if by moving the head horizontally to the right or to the left, we recede from the centre as much as six degrees, the image immediately loses all relief.

This is also the case when the image is only produced by the centre of the lens, consequently, stereoscopic and pseudoscopic effects are all less apparent according to the reduction of the aperture of the lens. For the same reason they may be seen in their greatest extent, if by means of a moving diaphragm, with two holes pierced through it, the image is only produced by the two extremities of the horizontal diameter of the lens. This method of making the experiments offers the most complete manifestation of the various phenomena, and facilitates the examination of them.

While the two holes above mentioned are placed in a direction of the diameter of the lens, so that if we bend the head horizontally so that both eyes should be in one vertical line, the stereoscopic effect disappears; and (still looking in this inclined direction) if we turn the diaphragm of the lens until the two holes take a vertical position, the stereoscopic effect reappears. In like manner, by preserving the vertical position of the two holes, if we draw up the head so as to have both eyes on the horizontal line, the image no longer presents a stereoscopic effect.

In short, there is stereoscopic effect only when the line passing through the two holes coincides with the line passing through the two eyes, and there is no stereoscopic effect when these two lines cross each other at a right angle. Thus, in turning the diaphragm on its centre so as successively to place the two holes upon all the diameters of the objective, we can at will obtain or lose sight of the stereoscopic effect, according as we look with two eyes in the direction of the line passing through the two holes or only to the right angle of this line.

If we make experiments with the full aperture of the lens, we procure the stereoscopic effect in whatever direction we look, whether at the horizontal, diagonal, vertical, or any possible angle, because with the full aperture or opening of the lens, each optic axis in its inclination of convergency always coincides with the rays of the image refracted on the ground glass through one of the opposite points of the lens, and all the other rays are gradually less perceptible as their direction departs from the line of the optic axis.

But it is remarkable that if the image is received on a thoroughly opaque surface (such as paper, &c.) instead of ground glass, it never offers, in any case, the illusion of relief when it is examined with both eyes.

The surface of paper or of any similar substance has the property of preserving to each eye the same intensity of all the rays which form the image, at whatever angle one departs from the centre. In any position we may place ourself, the visible image is the collection of all the different images produced through the points of the aperture of the lens. But if the paper is steeped in oil or melted wax, it acquires by this means a *molecular* transparency analogous to that of ground glass, and it then offers the same phenomena.

What, then, occasions the relief of the image produced

* Communicated by the Author.

on ground glass when one gazes on it with two eyes? and what causes the disappearance of this relief when one looks at it in an oblique manner, moving the head from right to left, merely at an angle of six degrees? To solve this problem we must call to mind some principles of binocular vision or of stereoscopic phenomena.*

(*To be continued.*)

PHOTOGRAPHY AND THE MICROSCOPE.

Mr. Editor,—Perhaps it would be difficult to find any other invention, that is not of vital importance to man, which has grown in so short a period to such a giant size as photography. Where has not the camera-stand been planted? Views of Rome, with its ancient arches and stupendous Colosseum and St. Peter's, are quite commonplace; Greece, with its temples of grace and beauty; Egypt and the eastern lands are not forgotten; and the cedars of Lebanon, almost sacred from the memories attaching to them, can be seen *as they are* by the aid of this wonderful art.

But one of the most marvellous applications of its powers is the production of those minute pictures which appear as a spot only to the naked eye, but when placed under the microscope, show monuments with every letter distinct—prints with every figure sharp as the original—or, perchance, some exquisite design. To such a production none will deny the right to be termed a *curiosity;* but we can grant it no other name. It can have no great use. We do not suppose that it is *commonly* known that it is no more difficult —nay, we believe, much less so—to produce *magnified* images, of some few inches diameter, by the use of the common achromatic microscope, without any apparatus except a camera, that may be a simple box with a hole to receive the microscope tube at one end, and the usual dark slide at the other. For the guidance of those who possess an achromatic microscope, we describe our method.

We use the common negative collodion, developed with the one grain solution of pyrogallic acid, and work as follows:—Choose a sunny day, and, having placed a table in the sun, arrange your microscope so that, after taking out the whole of the eye-piece, the tube may go into the camera at the lens end; then, with a cloth, or anything at hand, bind the tube so that no light can enter except through it from the object glass. The object is then placed in the usual slide, about the focal length of the object glass from it, using the reflector as you would by gas or lamp light. As the object comes nearer to the lens, the focal length becomes longer for the ground glass, on which it must be focused very accurately, and that *immediately* before putting in the prepared plate, as the sun's motion causes the reflected light to move over a common object in less than a minute. Having found the focus, whilst putting in the dark slide and opening the shutter, place some opaque card, or any other substance, betwixt the object and lens, and when all is ready lift up the card for some seconds, which must be longer and shorter according to light, focus of lens used, and object,—the inclosed flea (perhaps two inches in diameter) was taken with an inch lens of Ross' in seventeen seconds,—then develop and fix in the usual way.

This is all that needs mentioning, as every operator will alter the manipulation, &c., to suit his own convenience.

Doubtless many of your readers will regard this as nothing new, having known it, and perhaps worked it, for months; but if there are a few to whom this is a new branch of the art, they will perhaps find it an amusement when the windy weather excludes them from working landscape—for the great drawback to tree and scene photographers is neither light nor the want of it, but the want of *still* days. How many days are bright and sunny; yet how few are calm and still!

Of the objects fitted for this microscopic application it may be well to mention a few. Insects and flies of all kinds, some of which are exquisitely beautiful; sections of wood, showing the sap, vessels, and veins; the trunks of butterflies and moths also come out very well; and, indeed, almost all transparent objects.

The picture I send you, as I before said, was taken with an inch-focus object glass; but, of course, it must be understood that an object glass of any focus may be worked in the same way. With a quarter-inch lens I have got the scales of the Podura an inch long, and quite distinct; but as I have no print of that, I cannot show you its powers. This would be an easy recreation for ladies, as many are only debarred by the cumbrous apparatus from pursuing the art of photography in all its branches. Might not this also be useful when some lucky mortal has an object which is very rare? Here he would multiply representations of it, and their accuracy could only be surpassed, or even equalled, by the object itself. Θ

[We have to thank our correspondent for a beautiful specimen of the powers and capabilities of the arrangement he has so well described.—Ed.]

New Discoveries.

Printing in Carbon. *By MM. Henri Garnier and Alphonse Salmon.*

This process depends upon the adhesion of lampblack to citrate of iron, which has not been exposed to light.

A very strong solution of citrate of iron is first to be made; then select a fine glazed sheet of paper, and have ready a dry and smooth pledget of cotton. Dip the cotton in the solution of citrate of iron, and rub it over the sheet of paper, at first rapidly, and afterwards more slowly to equalise the coating; when prepared, allow it to dry in total darkness. When it is required to take a picture on this paper, place it under a positive print, and expose it to the light: in the sun eight or ten minutes will suffice, if the sky be clear, but without sun a quarter of an hour will do, whilst thirty minutes will not be too long if the sky be at all cloudy.

When the paper is taken out of the printing frame the image will be quite visible, but it will lack energy, and will show no detail; the blacks of the superimposed positive will have preserved the citrate of iron of its original colour and properties, and the next step will be to make use of these.

Remove the impressed paper into rather a dark place, but with still sufficient light to work by, and fasten it by the corners on to a perfectly smooth surface,

* In a succeeding number we intend giving an engraving of the stereomonoscope, taken from a photograph.—Ed.

face uppermost. Have ready prepared some perfectly dry lampblack and a pellet of wadding, and now dip the wadding in the lampblack and pass it lightly over the surface of the paper. Nothing will appear at first, but if during the time the lampblack is passing over, the sheet be equally breathed upon, the unchanged citrate of iron will absorb the moisture and the carbon will adhere to the surface whilst passing over it, and some of the details will appear visible. Now breathe on it a little more, and brush the lampblack again over the surface, when new details will come out; the operation is to be stopped when the carbon has been applied a sufficient number of times to bring out all the fine detail and half tones of the picture.

The proof is fixed by immersing it very carefully into a bath of filtered common water, quite free from dust or dirt on the surface. The citrate of iron which has not been decomposed by the sun will dissolve, and there will remain a positive picture, the blacks of which are produced by pure carbon, and which consequently is unalterable by any chemical agent. It can be dried and gummed, or varnished on the surface, if desired, and it will be finished.

This process does not differ in principle from those of Mr. Pouncy and M. Testard de Beauregard, except in the substitution of citrate of iron for bichromate of iron, and in the mode of working. We much doubt whether it will ever be possible by these processes to obtain really perfect pictures that will bear comparison with actual photographic positives, and give all the half tints and sharpness of detail. The first proofs, however, which were presented to the French Society are very satisfactory. COSMOS.

PHOTOGRAPHY IN ALGERIA.

MY DEAR SIR,—Presuming that the first number of the——I must wait until I receive it before I can give it the denomination by which you distinguish it——is already on its way here, I propose to forward you information of my proceedings in this colony as frequently as possible, in the hope that your readers may derive some amusement, if not instruction, from a perusal of such portions of my letters as you may consider best calculated to effect that object; only stipulating that, as I am a stranger in a strange land, and therefore likely to fall into errors which may place me in a ridiculous position, my name shall not be published. . . . .

Of the two objects that prompted my journey hither, viz., the improvement of my health, and the desire to visit and bring away photographs of scenes where events had occurred familiar to us from our school days, I have been successful only in the latter. I had been told so much of the warmth and genial climate of Algeria, that when I woke the morning after my arrival and found it dull, cold, and raining with that steady, incessant downpour which is associated in the minds of most of us with the recollection of a pic-nic party, I began to think I had been humbugged. For three days it never, as far as I am aware, ceased to pour down in the same uncompromising style, and I had already commenced inquiries as to the speediest means of reaching Alexandria, when it suddenly ceased, and I was enabled to traverse the streets and take note of buildings and other interesting objects with a view to future operations; and was gratified to find that I should have no lack of subjects. In the older part of the town the houses are lofty, and the width of the streets so trifling, that it would not be difficult for an active man to jump from a house on one side of the street into its opposite neighbour. I was not a little struck on returning to the more frequented parts of the town at the Frenchified appearance of everything. The shops were full of French goods, and Frenchwomen stood behind the counters, while the husbands of at least a good many of them were to be found among the tightly-belted, blue-tunicked, pegtop-trowsered individuals who pervaded the streets in every direction—proving how largely the military element enters into the composition of the population of Algiers. Cafés and restaurants are numerous, and are mostly kept by Frenchmen, although some of the former are held by Arabs. I entered one kept by an Arab,—a poorly-furnished room, lighted by one window, from which window I was told Jules Gerard dropped the native who had ventured to speak in contumelious terms of Frenchmen in general, and Gerard in particular, upon a heap of what I may in mild terms describe as refuse. . . . .

I was wandering alone outside the town, when my attention was attracted by a superstructure, the object of which was so evident that I looked round for a soldier of whom I might inquire the nature of the crime committed by the individual destined to have his career brought to such an abrupt termination. I soon found one, and, thanks to six months of "Cassell's French," and some little practice, I was enabled to comprehend the following narrative:—A man named Gilson inhabited a house a short distance from the town, together with his wife, her mother, a daughter about sixteen years of age, and another some years younger. One night about ten o'clock they heard a wagon drive into the yard, and a peculiar sound which a boy in Gilson's service, absent on some domestic errand, was in the habit of using for the purpose of gaining admittance, made the family suppose that he had returned. The mother opened the door, and several Arabs immediately rushed in, cut down the mother, and then murdered Gilson and his wife, whose bodies were hacked in a dreadful manner. The youngest daughter concealed herself behind a large barrel, from whence she could see all that was done, and was thus enabled to give a description of the murderers, one or two of whom were known to her, which led to their speedy apprehension. The eldest daughter darted out of the house at the instant the ruffians entered; but was pursued by two of them, who caught her, chopped off her hands at the wrists, and otherwise mutilated her in an indescribable manner; and, finally, one of them, with the intention of killing her, made a downward cut at her head, which nearly cut away the forehead from the skull, and left her, to all appearance, a bleeding corpse. Wonderful to relate, she did not die, and has since been conveyed to Paris, where she remains at this moment; her unfortunate condition but slightly alleviated by the receipt of a sum levied on the goods of the murderers. The object of the Arabs in this attack was plunder; Gilson having somewhat boastfully, though on the supposition that he was communicating with a friend, showed one of

the criminals some valuable articles of jewellery. The day following the little girl was taken into the town to the magistrate, to whom she gave the names of at least two of the murderers, whom she had frequently seen with her father at his house. One of these men was a sheikh, and comparatively rich. Other arrests were also made, and eventually one of the persons arrested made a confession, upon the strength of which seven Arabs were placed on their trial, all of whom were convicted and sentenced to death—the informer being subsequently spared.

I had no sooner heard this horrible tale than it occurred to me, that if I could get permission to establish my apparatus in a suitable position, the execution would form the subject of an interesting photograph. The execution was fixed for an early hour on the following morning, so that I at once hastened to the prison, and obtained the name of the officer appointed to command the troops who were to guard the scaffold, and from him I obtained the necessary permission to establish myself on the spot most suitable for the purpose. To avoid the possibility of exciting the feelings of the natives in any way, I determined to conduct the operation with as much secrecy as possible. With this view I hired one of the light wagons used for crossing the desert, and, with the aid of a couple of tarpaulins, soon contrived a somewhat capacious operating room, in which I placed all the requisite apparatus. By the time I had made these preparations it was necessary to start for the scene of the execution, as it was certain that an immense crowd would assemble in front of the scaffold. It was but a little past midnight when I arrived on the spot, yet even then the driver had some difficulty in making his way through the mob. Having ascertained, by means of my compass, the direction from which the rays of the rising sun would fall upon the scaffold, I placed my wagon accordingly; and then, with the self-satisfied feeling of a man who has sacrificed his personal convenience to the interests of his profession, I lighted a cigar and moved into the open air, more with the object of preventing any attempt on the part of the natives (who are great thieves) to cut a hole in the tarpaulins than of admiring the beauty of the night. . . . .

The crowd of men was immense; and as the rays of the rising sun fell upon their upturned, swarthy faces, it was painful to see the earnest and even frightened expression of their countenances. I had been present not long before at an execution in France, which thousands had assembled to witness; and the recollection of the jests and laughter I had then heard made the dead silence on the present occasion more impressive. I at first thought that this silence was owing to the number about to be executed, yet I could not reconcile this interpretation of it with the reports I had heard of the indifference of the natives to human life. I asked the driver of the wagon if such silence was usual, and learned from him, half a native himself, the reason. The Arabs are followers of Mahomet, and believe that their bodies, after death, will, by means of the tuft of hair they leave on their otherwise shaven heads, be conveyed by their prophet into paradise. Now, the head, which is completely separated from the trunk by the action of the guillotine, can alone, according to their belief, be placed in paradise, and as the body must be left on earth, they conclude (what is perfectly natural, seeing the nature of their paradise), that this arrangement will not contribute much to the owner's gratification. [I have since heard, that when the native chiefs executed a man by cutting off his head, the executioner invariably left it attached to the body by a bit of flesh, with a view to obviating the inconvenience referred to above.]

I purpose, in a future letter, giving you a detailed account of my photographic apparatus and arrangements for taking instantaneous pictures; it may, however, be interesting to your readers to know that I used on this occasion a stereoscopic camera with twin lenses. The process, of course, was collodion, some of Hardwich's make, and the bath contained glycyrrhizine in small quantity, to which the marvellous sensitiveness I attained in some of my pictures may be attributed. My lenses (view) were $\frac{7}{8}$ of an inch in diameter, and $3\frac{3}{4}$ in. focus;—a pair of *Grubb's* exquisite little productions, and the aperture was of the enormous size of $\frac{5}{8}$ of an inch, nearly the full aperture, and I can assure you, that even then they worked very sharply, and as rapidly as a good portrait combination. Part of the day before I had been busily employed in fashioning an instantaneous movement for uncovering the lenses; and, considering that the only available tools were those which were to be found in my portmanteau, I think I succeeded remarkably well. The stop was not quite as good as if it had been turned out of one of your London shops, but it worked to perfection, and being composed of cardboard, sewing cotton, and pins, it was lighter, and consequently more mobile than brass. My ambition was not merely to obtain a picture of the instrument of death, that I could have got any time, but to test to the utmost the wonderful powers with which I fancied my arrangements were endowed, by taking the moving objects actually *in transition*—the head in progress of falling into the basket, or the sharp blade in the midst of its descent. How well I succeeded you shall have an opportunity of judging as soon as I have time to print off a copy of the negatives.

. . . . The criminals were not brought on the scaffold together, but led up one at a time. The first was the sheikh, who seemed perfectly indifferent to his fate. So rapidly was he bound to the plank and thrust under the axe, that I had barely time to insert the plate-holder and get the instantaneous movement into order before the sharp edge descended, and his head rolled into the basket. This picture was quite successful, and so was the second, but the third presented a dim appearance, the fourth was nearly, and the fifth and sixth were wholly, invisible. How to account for this I know not, unless the atmosphere around the scaffold became in some way affected by the blood, the odour of which was distinctly perceptible to me. Perhaps some of your readers may be able to suggest the reason. . . . .

. . . . My letter has reached such a length that I have neither time nor space at present to tell you of a rather serious difficulty in which my photographic ardour was nearly involving me with the friends of the deceased. It is all over now, however, and I have still a whole skin, although, it must be

confessed, "more by good luck than good management." Perhaps I may devote the next rainy day to an account of my adventure, for the edification and warning of such of your readers as may be tempted to wander amongst a half-civilised tribe in search of food for the camera. Yours truly,

C. A.

Photographic Chemistry.

It is not our intention to write a complete treatise on chemistry, but only to treat of that science in its connection with photography.

All bodies are simple or compound; the number of the former being reckoned at sixty-two.

A simple body or *element* is one which cannot be decomposed by any known process. A compound body is one composed of two or more distinct substances, which can be separated from each other; which is then said to be reduced to its elements.

Whether simple or compound, all bodies are formed of an assemblage of particles or molecules infinitesimally small, each of which possesses the same properties as the entire body. These particles are held together by a force which is termed the *attraction of cohesion*—a force which varies in intensity according to the nature and conditions of bodies; thus it is especially apparent in solids, less so in liquids, and not at all in gases. Water furnishes an excellent example of all three conditions: as a solid in the form of ice; as a liquid in its ordinary state of water; and as a vapour in the form of steam.

In chemistry, when two bodies possessing different properties combine in fixed and definite proportions to form a third body, possessing properties different from either, there is said to be *combinations*. Thus metallic silver and iodine, which, in their simple state, are unchanged by the light, when combined so as to form iodide of silver, are acted upon by light almost instantaneously.

A mere mechanical *mixture* must not be confounded with a *combination;* in the former cases, each of the bodies remain distinct and unchanged.

Certain bodies possess the property of reddening blue litmus paper, and have a sharp taste. These are termed *acids*, as sulphuric acid, nitric acid, &c. Potassa, soda, and other bodies having the contrary power of changing the red to blue, are termed *alkalies*. If one of these acids be mixed with one of the alkalies in a certain proportion, both are *neutralised;* that is to say, they lose their peculiar properties, and no longer affect litmus paper. A new substance is the result, which is termed a *salt*. There are other substances which, though they do not act upon litmus paper, yet combine with acids, and produce a salt; these are termed *bases*—a term which also includes the alkalies.

Without entering too minutely and unnecessarily into the details of the science, we may here state that the simple bodies or elements are capable of being divided into two broad divisions, each having several properties in common, and likewise possessing a great affinity or tendency to unite with bodies of the opposite class. These two divisions are *metallic* and *non-metallic*.

These names almost explain themselves. In the first class are included all those bodies which possess the peculiar lustre, appearance, and chemical properties which belong to the metals. Silver, iron, copper, tin, as well as the more rarely seen potassium, sodium, calcium, &c., are examples of this class.

The *non-metallic* bodies comprise the remainder—chlorine, iodine, sulphur, oxygen, &c., are elements belonging to this second class.

We stated above that elements of the one class possessed a great *affinity* for those of the other class—non-metallic or metallic. They do not, as a rule, show such marked liking for any of their own class. Oxygen, however, is an exception to this. This element has such powerful affinities, that it enters readily into combination with almost every one of the other elements, irrespective of class, and forms with them well-marked chemical compounds.

Although oxygen is capable of uniting readily with elements of either division, yet the resulting compounds show, in a most marked and decided manner, their parentage. Thus the compounds of oxygen with those of its own class—the non-metals—are mostly possessed of acid properties; whilst its union with the metals gives rise to bodies having *alkaline* or *basic* properties. These will be again alluded to further on.

Hydrogen is an element which forms an apparent exception to the broad rule of the greatest affinity existing between elements of opposite classes, as its most marked compounds are formed by its union with those of its own class. In this case also it gives rise to compounds having acid properties, when it unites with several of the non-metals; thus, by combining with chlorine, the well-known substance hydrocloric acid, formerly called muriatic acid, is produced.

(To be continued.)

Dictionary of Photography.

Aberration.—A deviation in the rays of light when refracted by passing through a lens, by which they are prevented from uniting at the same focus. Aberration is of two kinds—*spherical* and *chromatic;* the former arises from the shape of the lens, and the latter from the unequal refrangibility of the various colours of which light is compounded. *Spherical aberration* is owing to the following cause;—Let us suppose that the lens under examination is plano-convex, that is to say, a lens which has one of its surfaces plane and the other spherical, and let the plane surface be turned towards a luminous body, from whence issue parallel rays of light; these rays will, after passing through the lens, be converged to a focus; but the focus of those rays which pass through the very margin of the lens will be at a point much nearer the lens than the focus of rays which pass through the central portion of the lens. The distance measured between these two focal points is called the *longitudinal* spherical aberration; and the diameter of the luminous halo, which the rays passing through the outer parts of the lens would form around the more distant focus of the central rays, is called the *lateral* spherical aberration. In a *plano-convex* lens, with its plane side turned towards parallel rays, as in the above example, the spherical aberration will be 4½ times the

thickness of the lens. If, however, the convex side of the lens be turned towards parallel rays, the aberration is only 1·17 times its thickness. In a double convex lens, with equal convexities, the aberration is 1·67 times its thickness. The lens which has the least spherical aberration is a double convex one, whose radii are as 1 to 6, and whose most convex face is turned towards parallel rays—the aberration is then only 1·07 times its thickness.

As the rays which pass through the marginal parts of a lens are refracted too much in comparison to the central rays, it is evident, that if the curvature were made to diminish gradually from the centre to the margin, the spherical aberration would be entirely removed. The ellipse and hyperbola are curves of this kind; and, since the curious discovery by Descartes of this property of lenses whose curvatures are elliptical or hyperbolical, philosophers and opticians have exerted all their ingenuity to construct lenses with surfaces of these curvatures; but the mechanical difficulties to be overcome are so great, that hitherto optical instruments have only been constructed with lenses having spherical surfaces.

It is, however, possible to get entirely rid of the spherical aberration by combining two or more lenses, and making opposite aberrations correct each other; and Sir J. Herschel has described several combinations of the meniscus (or concavo-convex) with the plano-convex lens which possess this property. Professor Petzval has recently introduced a new form of photographic lens for landscape purposes, in which the spherical aberration is nearly corrected by means of the addition of a *concave* lens to the ordinary view lens; and Mr. Grubb has also lately patented an improved construction possessing the same important advantages. It is a cemented compound lens, having only two glasses, whilst the curvatures are so adjusted that the spherical aberration is nearly corrected, thereby affording an image as distinct as that given by the old lens, using a considerably increased aperture of the new. This is an important advantage over the Petzval form of lens, as the addition of two lenses and four surfaces must make the latter combination much slower in its action for similar apertures and foci than the ordinary view lens.

Chromatic aberration will be explained under the head of ACHROMATISM.

ABSORPTION OF LIGHT.—When light passes through even the most transparent substance, some of the coloured rays of which it is composed are arrested, in quantities varying according to the nature and degree of opacity of the interposed medium. The transmitted light, supposing the colour originally to have been white, will now be coloured—the unabsorbed rays only reaching the eye. All transparent bodies exert some absorptive influence on light, and a knowledge of some of the principal facts in this subject will be found of the greatest use to the practical photographer. Even the most transparent bodies in nature, air, and water, when in sufficient thickness, are capable of absorbing a great quantity of light. This absorptive power of air is principally exerted upon the chemical or actinic rays of light, and is one of the causes of the greater rapidity of all photographic operations during the summer months, when the sun, rising daily to a considerable height in the heavens, shines down upon the earth less obliquely, and, consequently, through less thickness of atmosphere. There are few instances of substances absorbing all colours equally. Common black ink mixed with water is almost the only liquid possessing that property; and it has, on this account, been applied by Sir W. Herschel as a darkening substance for obtaining a white image of the sun.

Unfortuntely glass exerts a strong absorptive action upon the actinic rays of light—specimens, nearly colourless to the eye, being sometimes opaque to the chemical rays, the slightest yellow tinge being sufficient to cause an absorptive action.

In choosing a lens, the colour of the glasses of which it is composed should be noticed. This is best done by placing the lens on a sheet of good white paper, and observing the colour of the paper through it. If there be a yellow or green tinge, the lens will be likely to be slow in comparison with one having a whiter colour.

In the choice of substances for intercepting the active rays for the dark room, a knowledge of the absorptive properties of various yellow media is very necessary. Yellow calico is most frequently employed. This is, however, a very imperfect and unsafe material for such a purpose. One layer, it is well known, allows white light to pass through; consequently an increase in the number of folds merely diminishes the amount of transmitted white light, and in the same degree obstructs the illuminating yellow light.

Yellow tammy, a woollen fabric extensively employed by upholsterers, is very superior to yellow calico. The colour is deeper and more vigorous, and therefore fewer layers will suffice. It is, besides, not so liable to fade through constant exposure to light—an advantage which will be appreciated by photograpers in great practice. When it is required to obstruct *permanently* the active rays from a room by means of a yellow medium, other materials may be found more appropriate than either of the above. Pasting a double thickness of yellow paper entirely over the window panes is a very good and economical plan, and the one of all others which gives least trouble. More working light may, however, be obtained with equal safety by glazing the window with orange glass; or, if a small window only is employed, by interposing a large upright glass bath full of a saturated solution of yellow chromate of potassa. Either of the above plans may with confidence be adopted.

(To be continued.)

TIME BEATEN BY ELECTRICITY.—In the exchange of messages through the Atlantic cable the same singularities are noticed that were pointed out in the direct correspondence between Constantinople and London. The difference of longitude between St. John's, Newfoundland, and Valentia, in Ireland, is an arc of forty-two and a half degrees, or two hours forty-five minutes of time; and, consequently, a signal sent from Newfoundland at 8h. 25m. in the evening, would be received at Valentia at 11h. 15m., as if it had been sent in the night. On the other hand, if the message were sent from Valentia at 11h. 15m. at night, it would be received at Newfoundland at 8h. 25m. the same evening! If a telegraphic message were to be sent direct from Paris to New Orleans at three o'clock in the morning of the first of January, 1859, it would arrive at New Orleans at nine o'clock in the evening of December 31, 1858!!

A Catechism of Photography.

I.—DISCOVERY OF PHOTOGRAPHY.

Question.—What is photography?

Answer.—Photography is the art of obtaining pictures, upon prepared surfaces, by the agency of light. The name given to the art is a compound of two Greek words, and signifies writing or drawing by light.

Q. Who was the original discoverer of photography?

A. The honour of the original discovery belongs perhaps equally to natives both of France and England; but those who first reduced the art of photography to anything like completeness, were Mr. Fox Talbot, in England, and MM. Nièpce and Daguerre, in France.

Q. Were not the principles of the art known previous to the discoveries of these gentlemen?

A. They were. It was long known, for instance, that *horn silver* would turn black if exposed to the light, and that the blackness was vivid just in proportion as the rays of light which occasioned it were powerful.

Q. What is *horn silver?*

A. It is a preparation of silver, discovered by the alchemists in their fruitless attempts after the philosopher's stone, and is now called the chloride of silver. They observed, that when exposed to the light, this preparation changed to violet, and ultimately turned black.

Q. Could any photographic effects, similar to those which are now obtained, be produced by this agency?

A. In some degree such effects were easily produced. An engraving, placed upon paper covered with chloride of silver, and exposed to the sun's rays, leaves an inverse impression upon the prepared surface.

Q. In what manner is this effect produced?

A. That part of the paper covered by the engraving is preserved from the direct action of the sun's rays; where the paper on which the engraving is printed has retained its semi-transparency, the prepared surface is slightly obscured, the result being, that the impression taken on the prepared surface is the exact opposite in form and shade from the engraving—the light parts dark, and the dark parts light.

Q. What other discoveries were made in photography previous to the researches of Talbot and Daguerre?

A. Mr. Wedgewood, the porcelain manufacturer, obtained some success in his photographic investigations, as did also the illustrious Sir Humphry Davy. Wedgewood attempted to secure pictures by means of the camera obscura; and Sir Humphry Davy endeavoured to copy small objects by a solar microscope, but neither of these efforts were attended with any considerable success.

II.—THE CAMERA OBSCURA.

Q. What is a camera obscura?

A. A box fitted with a lens, through which the images of exterior objects are received, and transmitted to a piece of ground glass, placed at the back of the camera.

Q. By whom was the camera invented?

A. By Giovanni Baptiste Porta, a Neapolitan physician, about two centuries ago.

Q. What suggested the invention?

A. The discovery that if light were admitted through a small hole into a darkened chamber, all the objects without, from which reflected rays could reach the hole, would be pictured on the opposite wall.

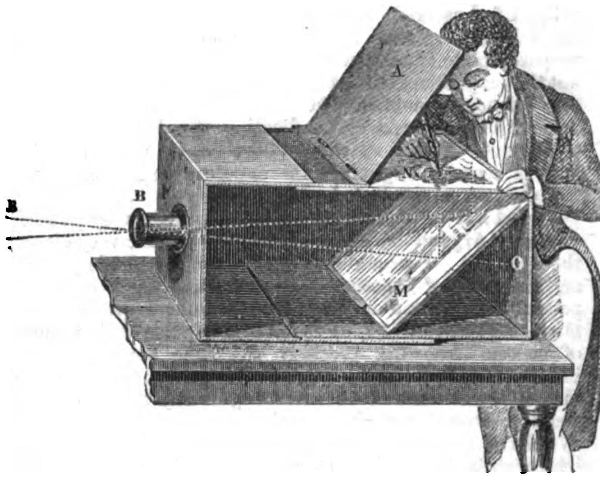
Q. Is a glass or lens necessary to produce this effect?

A. Although images may be received without the lens, they are confused and indistinct. A lens is essential for proper definition; and, in proportion to the power of the lens, is the image clearly defined.

Q. For what purpose was the camera obscura formerly employed?

A. It was used in drawing, especially by landscape and panorama painters, as sketches could thus be obtained with facility and accuracy.

The accompanying figure represents one of these old-fashioned cameras. It consists of an oblong box, into which the rays of light, R, are admitted through the lens, B, and form an object on the opposite side, O; but as the rays encounter a glass mirror, M, they change their direction, and the image is formed on the glass screen, N. Upon this a sheet of paper may be placed, and the outline of the image



readily traced. A is simply a flap or screen to intercept the light, which would otherwise render the image on the glass invisible. The box consists of two parts, sliding in a groove, and is so arranged for the purpose of obtaining a clearly defined image whatever may be the distance of the object.

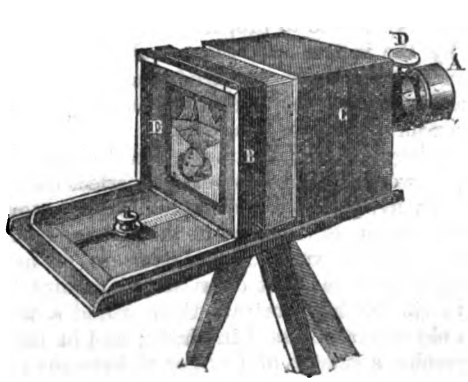
Q. In what way is the camera employed in photography?

A. The image being clearly defined on the ground glass of the camera, that glass is removed, and its place occupied by the prepared paper or plate, which receives and retains precisely the same image as that which was previously seen on the glass.

Q. What is the usual size and cost of a camera?

A. They are of various sizes, according to the dimensions of the picture to be taken by them, and their cost is *from a guinea upwards.**

The annexed engraving shows the ordinary form of the photographic camera. It will be noticed that it consists of a fixed part, C, and a movable part, B. The lens is contained in the brass tubing, A, and is moved backwards or forwards, within the tube, by means of a screw, D. Opposite the lens is a glass screen, fixed in a movable frame, F.



Q. What is the most essential part of a camera?

A. The lens, as on this depends the brilliancy and sharpness of the picture.

(*To be continued.*)

* Full particulars as to the size and price of photographic apparatus will be found in our advertising columns.

Photographic Notes and Queries.

MEASURING THE INTENSITY OF LIGHT.

London, August 25th, 1858.

MR. EDITOR,—I find myself constantly in error, principally, I feel assured, through being unable to hit upon the exact length of time for exposure in the camera of the prepared plate (positive collodion process). I have no doubt but that experience will set me right upon this head; but for convenience of amateurs, &c., could not some instrument be devised for the purpose of indicating the different degrees, or amount, of light existing, and then, by a corresponding scale of seconds, might not the exposure be always correct, and the process conducted with certainty?

I tried last winter to copy small engravings by powerful gaslight (Argand burners), placing the picture very close to the light, &c. I succeeded in getting excellent little pictures, and the time of exposure to this light, using a compound portrait lens and an ordinary ¼-plate camera, was *invariably thirty-five seconds*. Seeing that I could do this with certainty of success—knowing precisely the time for exposure—I imagined that something might be contrived to give one an idea of the amount of light existing at any time, so that he could go about his work with the same certainty of success. We have thermometers for indicating temperature, &c.; instruments for telling us of the humidity, &c., of the atmosphere, why not something to tell how much light (and the quality, perhaps) exists?

I am, sir, yours obediently,

ORIENTALIS.

[The proper time to expose the sensitive surface to the action of the light in the camera has been, and possibly always will be, one of the chief difficulties which the amateur has to contend with; and although some ingenious contrivances have been suggested for the purpose of measuring the chemical activity of the light at any given time, the apparatus required for this purpose would be either far too costly, or the results not sufficiently trustworthy to admit of the beginner deriving much benefit from them. Nothing approaching in simplicity to the other instruments mentioned by our correspondent could be obtained in the present state of our knowledge of actinometry; and even were the best of the suggestions which have from time to time been made carefully and efficiently carried out, we think that more time would be required to obtain sufficient experience to properly understand the result given by the instrument, than would suffice to make our correspondent so experienced a hand at the process he is following as to be able to dispense with any other light-measurer than his own eyes.

Supposing, however, the instrument to be made, and in use, it would afford but very imperfect data to act upon. Each subject to be copied would require a different amount of exposure in the camera, even if the light were not to vary. In portraiture, for instance, a young lady in a light dress would require far less time to sit for her portrait than would a weather-beaten old veteran dressed in black; and in landscape photography, a cluster of trees or picturesque nook in a garden would frequently require fifty times the exposure of a white building under the same circumstances. "Orientalis" must practice a little more, and he will soon find the difficulty of correctly estimating the proper time for exposure to vanish.

In our "Dictionary," under the head of Actinometry, we intend laying before our readers an account of what has hitherto been attempted in this branch of the science.]

BEST FORM OF LENS.—AMBROTYPES.

1st September, 1858.

SIR,—As I have learnt from the newspapers that it is your intention to devote a portion of the "PHOTOGRAPHIC NEWS" to answering the questions of your subscribers, I venture to ask you to have the kindness, first, to tell me what form of lens is suitable for intermediate-size photographs (10 × 8 to 16 × 14); and, secondly, what is the meaning of *Ambrotype?*

I am, sir, your very obedient servant,

A. M'P.

[1. The most suitable form of lens for photographs of the above size (which are, in our opinion, rather beyond *intermediate*) depends upon whether it is required for landscape purposes, or portraiture. For the former, supposing 12 × 10 be the size, we should recommend a lens of three and a half inches aperture, and eighteen inches focus; for portrait purposes, a lens to cover that field would require to be five inches aperture and twenty-one inches equivalent focus. In the selection of a lens many precautions must be taken, in order to make sure that the one chosen is really the one best fitted for the required purpose. We have a great objection to recommend publicly any one maker in preference to others; but if our correspondent would send his address to the Editor, care of the Publishers, we shall be happy to assist him by any advice which we may be able to give in the selection of a really good lens.

2. *Ambrotype* is the American term for collodion positives on glass. They are not known as such in Europe, and in consequence the photographic public here generally imagine that the term expresses a new kind of picture only known in America.]

PERMANENT BLACK FOR METAL WORK.

London, 4th September, 1858.

SIR,—Your prospectus says, that you intend to teach all the secrets of the photographic art; to solve all scientific enigmas; and to save photographers from the thousand and one dilemmas into which they are every day falling for want of a faithful Mentor, and ever ready and comeatable friend. May you be such a friend!

I am not quite so clever as I hope soon to be, but I, nevertheless, know quite enough not to require to be ashamed of showing a little ignorance, and I beg, therefore, to ask you for a recipe for giving a permanent black to metal diaphragms. I am, sir, yours truly,

W. T.

[A very good *dead* black may be given to metal work by mixing finely-ground lampblack with thin spirit varnish, and then brushing it over the article to be blacked. The quantity of lampblack and strength of varnish can easily be found whilst mixing.

Frequently black cloth, velvet, or unglazed paper, can be used with great advantage as a lining to cameras or lens tubes.]

TENT FOR PHOTOGRAPHIC PURPOSES.

Oxford, 3rd *September*, 1858.

SIR,—I want a Tent, and don't know where to get a *very* good one very cheap. I was the other day asked five pounds

for one! Will you kindly tell me where I can get a cheaper one? I am, your very obedient servant,

A PHOTOGRAPHIC ARTIST.

[Our correspondent should have mentioned the sized pictures he wished to take in the tent. The price mentioned is not exorbitant for a large and portable tent, with appliances suitable for pictures 10 × 12; but for working plates stereoscopic size a very simple arrangement will suffice. We have taken very excellent stereoscopic pictures in a tent which was home made. It consisted of a black waterproof cover, which was thrown over the camera legs, and having a hole about eight inches square cut out of the side, and filled in with two thicknesses of yellow tammy. The bottles were fastened by means of wooden screws and clamps to the legs, and the bath was likewise screwed to the *inside* of one of the legs. Water was kept in an india-rubber bottle. A little ingenuity will enable our correspondent to make something of this sort himself; but if a larger one be wanted, we must refer him to our advertising columns, as we have not had sufficient experience to be able to recommend any one particular tent.]

CYANOGEN SOAP.—PYROXYLINE PREPARED AT A HIGH TEMPERATURE.

5*th September*, 1858.

MR. EDITOR,—All hail to the cheap press! I am very glad to know that we are soon to have a cheap hebdomadal photographic newspaper. I hope that it will succeed, and you get rich through it, and we grow wise!

Will you tell me, in the first number of the "PHOTOGRAPHIC NEWS," a recipe for making Cyanogen soap. Secondly—What do writers on the manufacture of soluble pyroxyline mean by the term high temperature?

I subscribe myself, your

WELL-WISHER.

[1. The term "cyanogen soap" is applied to a preparation which is made and sold by a London house for the purpose of removing silver stains from the skin, &c. The mode of making it is kept a secret, but by means of a piece of pumice stone and a lump of cyanide of potassium all the good results attending the use of the cyanogen soap may be effected, at a tenth part of the expense.

2. The term *high temperature* in the manufacture of soluble pyroxyline is applied to a temperature of about 160° Fahrenheit. When prepared with acids of this temperature, the cotton produces liquid collodion, and yields a very glassy and structureless film, adhering tightly to the glass; whilst cotton, which has been prepared in cold acids, produces a thick glutinous collodion, yielding a very contractile film.]

STEREOSCOPIC GHOSTS.

Queen Ann-street, 7*th September*, 1858.

DEAR MR. EDITOR,—Will you have the kindness to tell me how the ghosts are made to appear half invisible in the stereoscopic pictures that I see in the shop windows.

Yours truly,

ATE J. R.

[The plan adopted by photographers for raising spirits is very simple:—Arrange the subject with the person whose ghostly representative you wish to secure, in the desired place, expose the plate in the camera (a stereoscopic camera with twin lenses should be used) for about half the requisite time; then carefully cover the lenses, remove the "ghost," taking great care not to disturb anything else, either of furniture or drapery, and then uncover the lenses, and expose for the remainder of the time.]

CLEANING GLASS AND PORCELAIN DISHES.—WASHING POSITIVES IN A RUNNING STREAM.

Hants, *September* 1*st*, 1858.

SIR,—Having seen your advertisement in the papers to amateur photographers, I wish to avail myself of your offer in asking a question or two.

1. * * * * * * * * * * * * * * * * *

2. How can glass dishes be cleaned? For if I scrub and scrub till I think they *must* be all right, yet still, in the waxed paper process, the development shows that they are still dirty.

3. As to washing positive proofs—a running stream is the thing. Now I have opportunities to make use of this, but can't tell how to, for this reason:—The water runs from an underground gutter into a large pond, which is on the same level as the mouth of the gutter. Can you understand this, and, if so, help me.

I am, sir, your well-wisher for success,

J. S. H.

[1. We know nothing of the apparatus you name, but will make inquiries, and answer in a future number.

2. You have, we suppose, followed the usual plan in cleaning dishes. After a dish has been made quite clean by chemical means, the final polish is given to it with a comparatively dirty cloth. We say *comparatively;* for what is commonly called a clean cloth might easily sully the purity of a chemically clean porcelain surface. We clean our dishes in the following way, and can confidently recommend it:—Remove the greater part of the dirt by good washing in hot water. Allow a solution of cyanide of potassium (two ounces to the pint) to stand in the dish for an hour or two, then pour it back into the bottle for future use, and give the dish a good scrubbing with a brush, remembering to clean the *corners* well; rinse with water; fill with dilute nitric acid (one part to eight), allow it to stand for ten minutes; rinse several times with common water, and, lastly, with pure distilled water; let it drain for ten minutes, and then dry and polish with *clean filtering paper*, or a *really clean* cambric handkerchief; the former, however, is better. If the dish be wanted in a hurry, pour a little concentrated nitric acid into it; rub it well all about and into the corners with a piece of tow at the end of a stick, then rinse, drain, and dry as before.

3. We can hardly advise on this point without having seen the pond, &c. However, we will try and suggest some feasible plan for the purpose. Of course there is a current of water flowing from the point of influx towards the centre or some other part of the pond. Can you not contrive a wooden box, with holes in the sides, so that when one of these sides was placed near the gutter there would be a continuous current of water through the box? By a little management in the position of the holes in the box which served for the ingress and egress of the water, so as not to have them quite opposite to each other, a rotatory motion would be communicated to the water as it passed through the box, and then positive prints placed therein would be washed famously. If they were in large quantities

there would be danger of their being matted together, and only revolving in a mass. You must guard against that—probably by having several such boxes, and placing a few prints only in each. We should like to know, for the benefit of our readers, what plan you really adopt, and its practical utility.]

ANSWERS TO MINOR QUERIES.

White Positives on Glass.—*Aspirant; A Photographic Amateur; Tyro.*—In answer to these correspondents, who desire to know how to obtain positives on glass, having pure whites with intense vigorous blacks, we recommend the following plan, as having been very successfully employed under similar circumstances:—Use a rather thinly iodised collodion, and add to each ounce of it two grains of bromide, and one grain of chloride of cadmium; let the silver bath be rather acid with nitric acid; develop with the following mixture:—

Sulphate of iron	15 grains.
Nitrate of potassa	10 grains.
Glacial acetic acid	20 minims.
Alcohol	30 „
Water	1 ounce.

The collodion should have a good share of pyroxyline in it; the plate must also be well drained, and wiped well at the back, and the developing solution should not be poured off and on whilst the image is coming out, but simply moved to and fro. When developed, wash well before fixing, and for this latter purpose use cyanide in preference to hypo.

Substitute for an Achromatic Lens.—*An Apprentice* wishes to know what he can get to answer the purpose of an achromatic lens. He has made a small photographic apparatus, and is now deterred, by the high price asked for an achromatic lens, from pursuing his experiments further. At the commencement of our own photographic career we were in a similar predicament. An old cigar box had been, by dint of much labour, converted into a camera; focusing screen and paper holders (collodion was as yet undreamt of) were carefully fitted to it, and a lens was the one thing wanting before we started, full-fledged photographers, in search of the picturesque. This was the first real difficulty we had met with; and, after many anxious moments, it was overcome in the following way:—Sixpence was invested in the purchase of a spectacle glass of about twelve inches focus; this was ascertained by measuring the distance between the glass and the image of a distant stack of chimney pots. Then a cardboard case (of the pill-box kind) about eight inches long and one in diameter, with a sliding lid, was found, and by cutting off the two ends and part of the case, it was transformed into two cylinders, open at each end, and sliding one into the other. The outer one was then *fixed*, by means of glue and gummed paper, on to the end of the camera, opposite the part where the focusing glass went—a hole being first cut in the box the diameter of the tube. The spectacle glass was next fastened, in a similar way, on to the end of the inner sliding tube, and then the *lens* end slid into the outer tube. This gave a pretty good image on the ground glass, but it was only good in the centre, and had a ring, of a nebulous, faint appearance, all round; this we obviated by fastening a piece of card on to the end of the inner tube, away from the lens, and cutting a hole, about a quarter of an inch in diameter, in the middle of it. The image now was much reduced in brilliancy, but the sharpness was exquisite, and the ring of faint light was quite gone. For some time this constituted the only apparatus we had; and, before it was cast aside for a larger and more costly apparatus, we succeeded in obtaining some capital views by its means. The principal defects were, slowness in work, the paper requiring to be exposed about twice the ordinary time; and limited extent of field, the lens spoken of above, instead of covering a field of 7 × 9 inches, would only take a 4 × 5 inch picture.

How to See if a Camera is Light-tight.—*A Freemason* complains of a *dark* spot about the size of a sixpence, with concentric circles gracefully extending outwards, and of lighter shades frequently occurring on his pictures. This is a difficulty which evidently arises from some mechanical defect in the lens tube or camera. First see if the spot always occurs on the same part of the plate; then examine the dark slide, and see whether there is a small hole opposite that part of the plate either in the front or back of the slide: this will be best seen by putting the slide in its proper place in the camera, unscrewing the lens, and then throwing the focusing cloth over your head, look in at the lens end of the camera, and carefully examine the opposite dark slide, first opening the *back* so as to see if the front slide is light-tight, and then closing the back, opening the front slide and examining the back in the same way. This test should be tried in sunshine, or in a strong light, and a little scrutiny will show the slightest cranny or chink capable of admitting light to the plate. If this scrutiny does not show the presence of any aperture, the fault must be in the lens or mounting. Screw the lens into its proper place again, point the camera opposite a well illuminated object—a white building with the sun shining on it will be best—and place in the focusing glass. Now throw the opaque cloth over your head, and carefully examine that part of the ground glass which corresponds to the *spot* on the picture, by looking at it from all points of view. Most likely some irregular reflection from part of the brass mounting will now be perceived, and by keeping the head in the position in which the light is best seen, and then removing the ground glass, some part of the brass-work will be seen reflecting light brilliantly where it ought not, or else light will be seen entering into the camera through some hole in the camera or brass-work. The remedy will be obvious; a piece of black velvet glued inside the lens tube, where the reflection takes place, or a metal or card diaphragm placed near the lens, will easily remedy one source of failure, whilst a plug of cork will be found an effectual stopper to all light through small holes.

TO CORRESPONDENTS.

F. C.—E. H.—K. F.—J. M.—O. P. Q.—An Old Friend.—F. S. C.—A. B.—J. J.—Rev. J. L. S.—T. G.—J. S. B.—H. M.—J. S.—X. Y. Z.—Ada.—W. P.—J. McG.—Rev. W. L.—The Editor wishes to express his most sincere and grateful thanks to the above friends, who have on the first announcement of his intended re-appearance before the photographic public so cordially welcomed him with kind offers of assistance, or suggestions for rendering the pages of the "Photographic News" more interesting and instructive.

J. B. incloses a beautiful positive print on paper, and asks us to point out the remedies to the faults we may see in it. We are afraid we cannot quite do as requested, the picture, in our eyes, being nearly faultless. We are inclined to think our correspondent is not quite such a novice in the art as he would make it appear. Acetic acid is the best thing to counteract too much ammonia in the bath. The other fault complained of must be owing to the negative being inferior.

D. H.—Mr. Rollason has a process for transferring positives on glass from the glass to black japanned leather or cloth; but as we believe he only communicates the process by license, and on condition of secrecy, we cannot enlighten our correspondent on this subject. We have seen many specimens taken direct on leather. The leather is fastened to a plate of glass by means of white wax or gutta percha, and then is coated with collodion sensitised, exposed, developed, and washed exactly in the same way as by the ordinary process on glass.

C. L.—Articles on the subject of grinding lenses are in contemplation, and will be given in an early number of the "News."

Received too late for notice in this number.—J. C.—Caustic.—F. S. C.—J. B.—E. B. G.—D. H.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, Belle Sauvage Yard. Private letters for the Editor, addressed to the office, should, in all cases, be marked "private."

THE PHOTOGRAPHIC NEWS.

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THE FUTURE OF PHOTOGRAPHY.

BY M. A. BELLOC.

THERE can be no doubt, that in all future time the photographic art, in its numerous varieties, and under its manifold forms, will rank amongst the grand discoveries which render illustrious the nineteenth century. Railways, which abridge space, and the electric telegraph, which annihilates it, are of those marvellous applications of science which compensate for its protracted meditations and its persevering labours. It is when science shows itself in works, which all of a sudden change and ameliorate the conditions of human existence, that the world realises all the grandeur of the discovery, and compensates for its disdain by unlimited gratitude. The photographic art is one of those fruitful applications which immortalise an epoch, and give to science its highest consecration. Until then, nature was reflected only in the clouds, in the water, and in some transparent substances—a fugitive reflection without utility. But now nature is subservient to our will, and can be reproduced upon substances at our disposal, and that with a permanency, and in such reduced proportions, as to enable us to form a collection, if we may use the term, of all its riches and all its treasures. Is not magic surpassed by such results? We can have inclosed in a frame the picturesque site which transported our imagination—the hamlet where we first saw the light; better still, a revered mother, a cherished wife, the child we idolise, and this not *almost* the same, as when man endeavours to imitate the objects of creation, but identically the same, inasmuch as it is nature herself which reproduces herself by reflection. Everything which is grand and beautiful in the universe and humanity may be religiously preserved. . . . . .

But, it is asked, what becomes of art if nature paints herself? Art, far from being dethroned, will reassume her true position; it will abandon the vulgar ground of imitation for the higher sphere of invention. To imitate is but to translate, and all translation is but an alteration more or less coarse. To aspire to the supremely beautiful is the essence of the real artist. The ideal is for him—reality is the domain of photography. Photographic art, though still in its infancy, has already made gigantic strides towards its full development. Is it after all an art? Is it a science? It participates of both; it is the conciliation, and almost "the fusion" of the two. It is art identified with nature, —it is "applied science." Perspectives, more and more extended, develop themselves in proportion as advances are made in this new domain. Routine has not yet had time to implant itself on this virgin ground. Traditions—inevitable processes—have not yet, as in most other specialities, reduced intelligence to a passive condition. There, each practitioner is an experimentalist. To operate ably, it is necessary to exercise all the sagacity which nature has allotted to you—all the faculties that labour and perseverance have developed in you; and each effort has almost always its immediate recompense. There is, perhaps, scarcely an operation conscientiously made which has not for its object a special light, even if it be but the most trifling detail of the work. At one time it is the object of the work which gives a glimpse of the possibility of acquiring a new perfection. At another time it is the substance employed to obtain this result which indicates, to some extent, the means of multiplying its force or its efficacy: or, still further, it is the instrument proper to prepare, to combine, to transform substances more or less heterogeneous, that use advises to modify in such or such a sense so as to derive from this instrument a more prompt and decisive assistance. In this new world, where, without reckoning on the interference of chance (upon which we must never count), observation suffices to put us on the road to discovery, we never pause, but always advance.

Do not believe that this art, which embraces so many things, which supposes so much general knowledge, tact, and experience, requires on that account exceptional men, this would tend to confine the practice to the exalted spheres of science, always inaccessible to the great majority of minds. The very contrary will be the case. The photographic art will realise the benefit so often and so vainly promised of the vulgarisation of science; it will render it attractive by the charm and facility of its application. In a few years, perhaps, most families will reckon among its members at least one operator. Observe, also, that in all things progress tends to simplify and reduce the instruments and labour to their most simple office . . . . . .

There are persons who fear, in the interest of the ideal, the cheapening of objects of art. A puerile terror! When that which is beautiful is within the reach of all, the artistic sentiment will perfect itself by the very fact of its extension. So long as taste is a privilege, it is almost always a caprice. When it has become a general faculty, though of divers degrees, it will elevate itself to a superior power; and it will have a *plus* value, if we may be allowed the term, in the imagination of the human species.

Photography is not limited to reproducing lines and surfaces. It has found its complement in the stereoscope, which gives to a design the most irresistible appearance of relief and of roundness, insomuch, that nature is no longer content to reproduce herself superficially, she gives, in addition, the complete idea of projections and contours; she is not merely a painter but a sculptor.

. . . . . . It would not be difficult to point out the moral result of this new art. It is not only curiosity that will be gratified by the reproduction of

objects most worthy of interest or admiration; the heart also will not be without its gratification. The portrait is no longer the privilege of the rich. The features of those whom we have cherished, and who have loved us, will give to the past all the charm, all the liveliness of the sensation of the present. They will eternalise for us the memory of all the little happiness we have enjoyed here below. . . . Happy those who may be able to assist in the development of this new art, which has made its *début* with so much power, and which brings us at the same time such vivid enjoyments and such sweet consolations.—*Revue Photographique.*

THE STEREOMONOSCOPE.*

BY M. A. CLAUDET.

No stereoscopic effect can exist but when each eye perceives an image of different perspective, and when the pairs of similar points of the two retinal images have these points less convergent and more distant from each other, according as the objects which they represent are nearer; and more convergent, or less separated from each other on the two retinæ, as the objects are at a greater distance from the spectator.

From the horizontal position of the two similar points of the two images on the retinæ, it results that, to make them coincide successively on the centre of the two retinæ (an indispensable condition of distinct vision and single perception), one must converge the optic axes more, to examine the point nearest the solid, and converge them less and less as the points are more and more distant. In like manner, no pseudoscopic effect can exist, but when, by inverting the perspective images, which reverse on the retina, the relation of the distances of the similar points of the two retinal images, we make them coincide at the centre of the retina. It is necessary to converge the optic axes less for the nearest point, and more and more for points more and more distant. This is because, in every case, the sensation that accompanies each angle of convergence, gives us by habit a true or false judgment of distances. A true judgment when the different degrees of convergence follow the natural order (which is to augment in proportion to the nearness of objects, and to diminish in proportion to their distance), and false when it follows a contrary order.

When the two images are separated, as is the case in the stereoscope, that to the right is brought to the centre of the retina of the right eye, and that to the left, to the centre of the left eye by means of the refraction of the lenses. We can obtain the same effect without the stereoscope, and even in greater perfection, merely by separately directing each optical axis on the centre of the image opposed to it. In this disposition of the optical axes, which is in fact the natural one, when we look at an object more distant than the images, that to the right is painted on the centre of the right retina, and that to the left on the centre of the left retina.

This separation of the images does not exist on the ground glass when they are produced by the two horizontal apertures of the lens, and as on the contrary they are superimposed, it would not be possible separately to converge each optical axis on one single point of the image (the perspective of which belongs to it), if each eye saw at once the two points of the different perspectives of the superimposed images.

It is absolutely necessary that each eye should perceive only one image, and that the two images should be of different perspectives, for it is only on this condition that the play of the convergencies, through which we obtain the perception of the distances, can be exercised. If each eye saw at the same time the two superimposed images, there would result, in the centre of the two retinæ, confusion in the coincidences of the various points of the different perspectives of the solid. Some would produce a stereoscopic, and others a pseudoscopic effect. These effects would destroy each other, and the resultant image would be without relief. This is exactly what takes place, when the image is received on fine paper or on any surface of similar transparency.

Now, as ground glass really gives the illusion of relief, it can only arise from each eye perceiving the image, the perspective of which belongs to it, whilst the other remains invisible, for otherwise the eyes could not each choose, in the union of the two images, that which was proper to each, while it rejected the other.

Foreseeing an objection that will doubtless be raised, and one which, in the mind of certain persons, might have some appearance of plausibility in combating my theory, I must remark once for all, that when I say "the image visible to one eye is invisible to the other," I do not pretend that it is completely invisible, but only that it is so weak that the attention is not arrested by it, and is directed to the clearest and most vigorous image. It is only in a physiological sense that, in the course of this paper, I employ the terms visible and invisible.

The phenomenon of two images superimposed on the ground glass, each visible to one eye, and invisible to the other, is proved by the experiments already mentioned; but there is one that is much more decisive, and which consists in placing a blue glass before one of the two marginal apertures of the lens, and a yellow glass before the other. The effect of these coloured glasses is, that each produces on the ground glass an image of its own particular colour. Two superimposed images are the result: the one image blue, and the other yellow, forming, by coincidence, only one image of a gray tint (the mixture of yellow and blue) when we gaze at it with both eyes. But if we shut alternately the right and left eye, we see a blue image in one case, and a yellow one in the other.

While we look with both eyes (the aperture to the right being covered by the yellow glass, and that to the left by the blue glass), if we move the head horizontally to the right, as soon as we obtain an inclination of six degrees, the mixture of the two colours disappears, and the image becomes blue. If, after returning to the centre, whence we always see the same gray tint (the mixture of the two colours), we move the head to the left, as soon as we attain on this other side an inclination of 6 degrees, the mixture again disappears, and the image is quite yellow.

The same effects occur, if, being placed in the centre, whence we see the mixture of the two colours, we close alternately the right and left eye, in one case the image is blue, and in the other it is yellow.

When the blue and yellow images are received on paper, the mixture of the two colours is preserved perfectly well; if we look with one eye, or if we look with both, or straight before us, or if we incline the head to the right or to the left, we cannot in any manner separate the colours, and behold only one of them.

Attentively considering all that passes in the course of experiments with coloured glass, we observe that the rays refracted by the yellow aperture to the right of the lens, fall obliquely from right to left on the centre of the ground glass, while the rays refracted by the blue aperture to the left of the lens, fall obliquely from left to right. These rays from opposite sources cross each other in the focus of the camera, and, supposing no ground glass to be present, they would continue their course in a straight line, those that emerge from the aperture to the right, taking their course to the left, and those from the left aperture taking their co[urse] to the right. Now, as a refracted ray is only visible w[hen] it coincides with the optical axis, it is evident that wh[en] the ray refracted obliquely by the aperture to the left of the lens falls on the retina of the right eye, it cannot at the same time penetrate into the left eye, and when the ray refracted by the opening to the right of the lens strikes the

* Continued from p. 4.

retina of the left eye, it cannot penetrate into the right eye. Thus, the right eye only perceives the blue image, and the left eye only perceives the yellow image. Consequently each eye sees an image of different perspective, and we receive on the retinæ two images capable of imparting the stereoscopic illusion.

If at the spot where the oblique rays cross, which is the focus of the lens, we place ground glass, the two images produced by the two apertures appear represented on the surface, where they coincide, but, by a singular phenomenon, each of the two images is not visible to both eyes at once. The right eye perceiving only the image to the left, the rays of which strikes obliquely the surface of the ground glass, and without being arrested by this surface, falls on the pupil of the eye. The same thing happens with the other image, of which the left eye only perceives those rays, which, in their oblique course, coincide with the axis of this eye.

But how does it come to pass, that if, instead of ground glass, the images are received on plain paper, or on any other similar surface, each eye sees the two images at once, and that, whether we look with both eyes or with one eye, or with the head to the right or the left, the image always preserves its mixture of the two colours?

In order that these effects should show themselves differently on each of these surfaces, it is necessary that the rays should continue their course in a straight line through the ground glass, from the aperture to the left, into the pupil of the right eye, and from the aperture to the right into the pupil of the left eye, and that they be not arrested on the surface of the ground glass. But if we substituted paper for ground glass, the rays must be arrested in their course on this perfectly opaque surface, where the image then becomes fixed; and each molecule of this surface should, on becoming luminous, emit new rays, diverging in every direction, so that each eye should at once perceive all the images superimposed on the paper in any position we assume, whether in the centre of the camera, or with the greatest possible inclination to the right or to the left.

Such must be the cause of this phenomenon; and, in fact, it is easy to prove, that ground glass and paper have, inherently, entirely different properties; that the former allows a free passage to the direct transmission of the rays which meet its surface; whilst the latter is an obstacle to this direct transmission, and even scatters them at every possible angle.

In fact, if we place before the sun, or before a lamp, a frame, half of which shall contain a sheet of paper, and the other half a square of ground glass, and if we look straight at the two surfaces, we see the paper and the ground glass, although equally lighted from behind, transmit the light unequally; *that* from the ground glass appearing much more intense than *that* from the paper. But if we depart from the perpendicular, and move sideway either to the right or to the left we gradually lose the light from the ground glass until it entirely disappears, while the surface of the paper preserves the same intensity of light, in what position soever we look at it.

(*To be continued.*)

THE STEREOSCOPIC ANGLE.

OUR able contemporary, the *Literary Gazette*, contains the following very able and lucid remarks upon the "Stereoscopic Angle," refuting some of the scientific reasonings of Mr. Lake Price, as set forth in his manual of "Photographic Manipulation:"—

"In his directions for taking stereoscopic pictures, Mr. Price, writing in accordance with the common, but as we believe very erroneous notion, says, with reference to the placing of the lenses, that, 'at ten feet from the subject three inches apart would be ample to give a natural, and, at the same time, striking relief,' but beyond that the cameras must be set farther apart in proportion as the distance of the principal object increases. 'The fact is,' he goes on, 'that, according to the class of objects to be treated, the mode of representing them must be varied; for if such an angle as three inches were applied to a view in nature, the extreme distance being mountains, some ten miles or more from the cameras, the picture would be *flat*, owing to the insufficient angle given. For such subjects *fifty feet apart is not too much*, provided always that the *foreground objects* are not *near* the lenses, as then they would of course suffer much distortion.'

"Now, this is not only erroneous in itself, but inconsistent with what the author lays down elsewhere, with all the emphasis of italics, as 'that which must be the object of our imitation—*nature as seen by the human eye*.' Nature as seen by the human eye can only be represented in the stereoscope by stereographs taken with lenses little, if at all, wider than the eyes apart. For near objects Mr. Price admits that although a greater appearance of relief can be gained by increasing the distance of the cameras from each other an inch or two, that additional relief is in fact a distortion, that is, untrue representation. Yet for distant mountains he would increase the distance to fifty feet merely in order to get rid of the flatness in the appearance of the mountains, for the intermediate objects he acknowledges requires no such separation of the lenses to obtain adequate relief. Now, we have studied among the mountains as well as Mr. Price, and we venture to affirm that the stereoscopic picture of a mountain ten miles off, taken by cameras fifty feet apart, would be as utterly, though not as palpably, untrue, as the picture of any ordinary object ten feet off would be if taken by lenses a foot apart; while the appearance of all objects in the middle distance would be rendered utterly wrong. In truth, in looking at very distant mountains in nature the eye sees little relief or solidity. The mind has the sensation of solidity, because experience and knowledge tell it that the mountain is really a vast mass with its mile after mile of green sward and purple heather, its long stretches of boggy peat and moss, its woody crags and gloomy clefts, and bare precipices, and leaping streamlets, and shattered peaks. But when the stereoscope presents us, by means of a couple of stereographs taken from widely separated stations, with a picture of the far-off mountain, and all the intermediate scenery, as it never could by any possibility be seen by human vision—for the most determined stickler for taking stereographs after this fashion will admit that the human eyes could never be projected fifty feet apart—we get indeed an increased appearance of relief, but the mountain is degraded in size and impressiveness, and the whole has very much the character of an ingenious model. Hence it is that stereoscopic views of mountain scenery which have been taken upon this system are generally felt to be unsatisfactory—almost toy-like—in character, though the unreflective observer may not discover why. The uneducated eye is delighted to see in the stereoscope objects stand out with a measure of rotundity and relief so much greater than it ever saw in nature, and the vulgar stereoscopist takes care alike in his scenes from nature, and in his coarse groups of semi-nude females, to pander to the popular taste. But the true artist will neither degrade his art by choice of unwholesome subjects, nor by intentional untruth. If the reader is inclined to say that we have dwelt too long on a comparatively unimportant point, let him ask himself whether he does not value the stereoscope because he has been accustomed to consider that it presents him with views of unimpeachable fidelity as well as singular reality; and if so, whether it is not desirable that a system which must of necessity render its views untrue, and therefore comparatively untrustworthy, should be opposed at all times, but especially when set forth in a manual which will undoubtedly take rank as a leading authority with the photographer. But it is becoming more than ever essential that the stereoscopist should be impressed with the importance of aiming at the most exact truth, at the risk though it be of some little loss of effect, for the stereoscope is becoming a great instructor. By it, Egypt and Palestine have been

brought home to us; Teneriffe has been put on the study-table; the glaciers of Switzerland may be examined at our leisure; and soon regions as yet untraversed will be rendered familiar; and what if, after all, from the stereoscopists proceeding on a wrong system, we have views perfectly free from 'flatness,' but at the same time perfectly unlike what the human eye would see? It is indeed of primary importance that stereoscopists should feel that what they have to aim at, especially in unfamiliar scenes and regions, is to produce stereographs strictly, and, so to speak, scientifically accurate —views upon which the observer might reason with as much certainty as though the scene itself were before him. We should, in truth, like to see on every 'slide' marked not only the date and the hour when the view was taken, but the distance of the lenses apart."

New Discoveries.

PAPER-GLASS AND INDELIBLE POSITIVES. *By M. Gaumé.*

M. Gaumé, an experienced artist of Mans, has presented to the French Photographic Society, in competition for the prize offered by the Duke de Luynes, a memoir on a new method of printing and fixing positives, which consists chiefly in the preparation of what he designates *paper-glass,* upon which the positives are as unalterable as upon albumenised glass. We are enabled, through the kindness of M. Gaumé, to give, in this number, a complete account of his invaluable discovery. The theory upon which he proceeds is this:—

"If we examine carefully a faded positive proof, it will soon be perceived that the picture still exists, but that it is obscured by a subjacent substance, not formed by the hyposulphite of soda,* as has hitherto been imagined, but by a compound of silver, which has penetrated the paper, and has not been converted into chloride. It is therefore necessary to find a means of preventing the nitrate of silver from penetrating into the substance of the paper, or, in other words, to form what may be called paper-glass.

"In 1853, having employed basins of cardboard, coated with gutta percha dissolved in benzol, and finding that these vessels would hold the solutions for a long time without getting out of shape, I thought afterwards that if I were to decolorise the gutta percha, and then to impregnate the paper with it, I might afterwards coat it with albumen, and then proceed to take a positive on it in the ordinary way.

"To prepare the gutta percha solution, place forty or fifty parts of gutta percha and a hundred parts of pure benzol in a glass flask, and dissolve by means of a water bath. Allow the coloured part to settle, and when the liquid has become of a light amber colour and perfectly transparent, decant the clear part, and add benzol if experience shows that it is too strong; for it is necessary that the paper, after passing through this mixture, should remain almost as opaque as before, in order that the photographic image may be good, and not look like a waxed proof.

"The paper is prepared in the following manner:—Take a glazed porcelain dish, fill it with the above solution, and cover it with a glass which is a little smaller, so that it rests only on two opposite sides of the dish (a vertical bath such as is used for the silver bath, in the collodion process, would be better), in such a manner, that by passing a sheet of paper between the edges of the dish and glass on one side, and pushing it with the left hand, it will emerge, curling up at the other side of the dish between the opposite two edges, and may be taken by the right hand and removed from the liquid without any stoppage. Now hang it up by one corner; and when it has changed from being transparent (which it is on coming out of the liquid) to being almost as opaque as it was before immersion, hold it before a brisk fire to melt the gutta percha which the benzol leaves in the form of little white granules. The sheet then becomes a little more transparent, and as firm as parchment, and is quite impervious to those substances which go to form a photographic proof.

"I next coat it with chlorised albumen, as is usual with other paper, either by forming the sheet into a little tray in which the albumen is poured, or by laying it on the surface of the albumen, as is customary with most operators. It matters little how it is done.

"I excite, as usual, in a fifty or sixty grain solution of nitrate of silver, and when quite dry, I proceed to print from a negative on it in the ordinary manner, and fix in hyposulphite of soda; the stay in this bath need only be very short. It would only require the time of a negative on glass; but as I put the chloride of gold in this bath, it must remain until it is of the desired colour. I wash in a large quantity of water for a quarter of an hour, or even less; it may, however, be washed longer if thought necessary. Dry in blotting paper first, and then before a fire, and the picture, of an admirable transparency, appears to me to be indestructible.

"This process, which seems long at first, is really very short, since the last operation takes hardly any time, and the first not more than a minute for each sheet.

"The price is also less, since, owing to the paper being unabsorbent, the bath of nitrate of silver does not weaken so rapidly."—*Cosmos.*

PERMANENT PRINTS IN SULPHUR. *By MM. Henri Garnier and Alphonse Salmon.*

The chemical reaction which takes place between sulphur which has been exposed to the light and mercury is the basis of the present discovery.

A piece of roll sulphur is dissolved in bisulphide of carbon in the proportion of one of sulphur to three of the bisulphide, and then filtered. Pour on to a sheet of paper a sufficient quantity of this solution, and move the paper about briskly in all directions, not only that the liquid may spread uniformly, but to prevent the formation of crystals of opaque sulphur, which are not sensitive to light, then preserve the sheet of prepared paper in darkness. At the proper time place the sheet under an ordinary negative, and expose it to the light twenty-five seconds to one minute in the sun, two minutes on a clear day, or five minutes on a cloudy day.

Nothing will be seen when it is removed from the pressure frame. Place a little mercury in an iron vessel, and heat it by means of a spirit-lamp. Three

* Only in some cases in others the hyposulphite exerts the principal fading action.—Ed.

or four inches above this stretch a sheet of good smooth paper, and lay on this the sheet which has been exposed to the light, the sensitive side below facing the cover of the vessel which contains the mercury. The mercury volatilises, and its vapour filtering, as it were, through the underneath sheet of paper, acts upon the sulphur which has been acted upon by the light, and produces a dark sulphide of mercury, which brings out in a very perfect manner all the details and half tones of the picture. Protect this black sulphide of mercury by a coating of varnish, gum, or albumen, and the operation is terminated. In order to better protect the image from the direct action of the mercury vapour, it will be as well also to place the exposed paper between two sheets of ordinary paper; the action of the mercury is thus rather slower, but more certain.

The sulphide of mercury which forms this image is unalterable by alcohol, ammonia, ordinary sulphuric, nitric, or hydrochloric acids, cyanides, organic acids, alkaline sulphides, &c. &c. Aqua regia, strong nitric acid, and acid nitrate of mercury are its only solvents; heat only affects it at an elevated temperature.

Mr. Salmon concludes by remarking that in this new process the chemical reaction is remarkably simple; in the old process on the contrary, there is a very complicated and intricate chemical reaction: and in order to bring out the image in perfection it is necessary to introduce agents which cannot be entirely removed from the paper, and which ultimately destroy the picture in spite of all that people say or do on this subject.

In order to judge properly of the value of these processes, and of the chance which the authors have of obtaining the prize offered by the Duke de Luynes, it will be necessary to wait until the ingenious and skilful authors have produced pictures which they consider perfect specimens of the capabilities of the process. The pictures which are at present to be seen are very interesting and full of promise, but they do not as yet come up to our *beau-ideal* of the desired process.—*Cosmos.*

Critical Notices.

REVIEWS OF BOOKS.

What to do in Photography, and how to do it. By G. WHARTON SIMPSON. London: Henry Squire and Co., King William-street.

THIS is essentially a practical book, of which the style is very simple and perspicuous. Unlike the writers of many elementary books on Photography, the author has not presupposed any previous knowledge of the subject in his readers, but has begun at the beginning, explaining everything that can need explaining, and has carried the tyro through each stage of the collodion process on glass, and printing on paper. The result is a work instructive to the novice, and a comprehensive text-book for the practical photographer.

An especial feature of the book is the introduction of a new process under the name of Alabastrine Photography, some specimens of which have been brought under our notice. As glass positives we have seldom seen anything to equal them, whether in their character as photographs, possessing whites of great purity, and rich blacks, or their susceptibility of receiving high finish in colouring by the ordinary dry colours. The process appears very simple, the usual material of glass positives being employed up to a certain point, after which the application of a redeveloping agent, and a suitable varnish, completes the process. The results we have seen are well worth the attention of photographers.

Hints on Fothergill's Process. By W. ACKLAND. London: Horne and Thornthwaite, Newgate-street.

WE have received a small pamphlet under the above title, the perusal of which has given us much pleasure. It is a simply-written account of a process which promises to be one of the best dry collodion processes known. Each operation is taken in detail, and is treated neither diffusely nor too scantily, but in a manner equally intelligible to the beginner and the practised operator. Every line bears the impress of being carefully written by one who evidently is thoroughly acquainted with the process. It is not likely that the reader will be confused with a superfluity of useless technicalities; on the contrary, he may gather many valuable hints. It is, we see, published gratis, and we presume it is obtainable on application at Messrs. Horne and Thornthwaite, 121, Newgate-street.

Since writing the above we have received the following important addition to the "Hints." For the benefit of those of our readers who already possess the first edition, we quote it in full:—

"Having found that uniformity of development depends much on a *uniform* film of *pure* nitrate of silver solution being left on the plate after washing in the well bath, fig. 3, the following expedient has been adopted to gain this desirable end:—

"On removing the collodionised plate from the bath, fig. 2, it is *well washed* (back and front) in a basin of clean water, or under a tap, until all the greasy appearance presented by the film, on being wetted with water, is removed. It is then placed collodion side upwards in the well bath, fig. 3, into which (for a stereoscopic size plate) a solution, made by dissolving twelve grains of fused nitrate of silver in six ounces of distilled or filtered rain-water, has been introduced. The plate is allowed to remain undisturbed for about a minute, whilst a second plate is coated and placed in the bath solution. The well bath is now agitated with some violence for about thirty seconds, so that the solution may thoroughly mix with the moisture on the film.

"The plate is then removed by the aid of a silver wire hook, drained for about ten seconds, with one corner resting on clean filtering paper, and is then ready to receive the coating of albumen as described at page 4.

"The solution in the well bath will serve for preparing one dozen plates, and must then be thrown away, and a fresh quantity mixed for a further number of plates.

"It will be noticed that by adopting this plan the free nitrate of silver left on the plate for decomposition by the albumen is *perfectly pure*, and devoid of any contamination or change that so frequently occurs in the nitrate bath.

"*September* 15*th*, 1858."

LEEDS PHOTOGRAPHIC SOCIETY.—PROPOSED EXHIBITION.

THE town of Leeds has lately been all astir with the excitement which usually attends the ceremonial of a royal visit. On the occasion of the opening of the Town Hall her Majesty graced the occasion, and the reception which she received was such as to throw all other demonstrations of loyalty in the shade. After the royal visit came the Musical Festival, and now the Leeds Photographic Society have decided upon

holding an exhibition there, in connection with the British Association for the Advancement of Science. This is a commendable step on the part of the Photographic Society of Leeds, and it shows that photography can receive no harm from being in the hands of men who are so ready to turn every opportunity of advancing the cause to good account. The exhibition opens some time this month, and we shall be glad to hear that the scheme has met with that support which it deserves.

Photographic Chemistry.

CHEMICAL NOMENCLATURE.

If every compound of simple bodies had a special name given to it, without any regard to rule, there would be no end to the confusion that would ensue. Chemists have therefore decided upon a method of naming compounds, which is both simple and expressive; this is termed the *chemical nomenclature*.

Simple bodies combine in the proportions of 1 to 2, 3, 4, &c., to form compounds, which, in the case of acids, are thus designated:—If the body forms but one acid with oxygen, the termination *ic* is added to the name of the simple body; thus a union of carbon with oxygen gives carbon*ic* acid. If the body forms more than one acid, that more oxygenated takes *ic*, the less *ous*, as in the case of the combinations of sulphur with oxygen, forming sulphuric acid and sulphurous acid.

An acid more oxygenated than that ending in *ic* is indicated by prefixing *per* or *hyper* to the name of the element. Take chloric acid for example: a larger quantity of oxygen would form *per*chloric acid; and still more, *hyper*chloric acid. On the contrary, if the acid contains less oxygen than that ending in *ic*, and more than that ending in *ous*, it is indicated by the prefix *hypo*; thus, *hypo*chlor*ic* acid is more oxygenated than chlor*ous* acid, and this again more than *hypo*chlor*ous* acid.

Those acids containing hydrogen take the same termination *ic;* but its presence is indicated by prefixing the abbreviation *hydro* to the name of the body. Thus we say,—hydrochloric acid, &c. &c.

Oxides are formed by the union of oxygen in certain proportions with an element, mostly a metal, as oxide of silver, copper, &c. If the element combines with several equivalents of oxygen, the least oxygenated combination is termed *proto*xide; the next, *bin*oxide; and one containing still more oxygen, may be termed *per*oxide. When binary compounds contain neither oxygen nor hydrogen, or if they contain the latter, have not the character of an acid, they are denominated by a union of the names of the two compounds, the name of the first-mentioned body ending in *ide*, and the second remaining unaltered; as brom*ide* of potassium, iod*ide* of silver, &c.

Again, when two elements have several compounds in *ide*, these are expressed by the prepositions *proto*, *bi*, *ter*, or *per*.

The preposition *sesqui* is employed to indicate the combinations of two equivalents of one body with three of another, as the *sesqui* oxide and *sesqui* chloride of iron, containing respectively two equivalents of iron for three of oxygen or chlorine.

We have now to examine the case of bodies formed by the combinations of an acid with a base (salts). Nothing is more easy than the rule which governs their nomenclature. The name of the acid is joined to the name of the base, only the acid in *ic* takes the termination *ate;* the acid in *ous* the termination *ite*. If we suppose the acids of sulphur combined with soda, we shall have with sulphur*ic* acid, sulph*ate* of soda; with sulphur*ous* acid, sulph*ite* of soda. If a simple body gives rise to several oxides, the salts formed with these bases are termed as follows:—sulphate of *pro*toxide, sulphate of *per*oxide, &c.

Bases and acids combined with water are called hydrates, as hydrate of potash, hydrated sulphuric acid. The particles *mono*, *bi*, *ter*, indicating the degree of hydration.

(*To be continued.*)

Dictionary of Photography.

Absorption of Light (*continued*).—M. Niépce de St. Victor has recently made the important discovery that a body which has been exposed to the effects of strong sunshine (or which has been *insolated*) retains in darkness the effect of this exposure, and is capable of producing in some respects the same effects as a luminous body, by virtue of the light which it has absorbed during insolation. For instance, we will suppose that an engraving which has been kept for some days in darkness is exposed to the full rays of the sun for about a quarter of an hour, one half being covered with an opaque screen. At the end of that time it is removed to the dark room, and kept for twenty-four hours in close contact with a sheet of sensitive photographic paper. On examination, it is found, that the white portions of the engraving which had not been protected by the screen during its exposure to the sun, have been reproduced in black. If the engraving be kept for some days in darkness and then applied to the sensitive paper, without having previously been exposed to the sun, no result is produced. The insolated engraving need not even be in contact with the sensitive paper; it will be reproduced at the distance even of a quarter of an inch off if the design be bold, consequently it is not the result of contact or chemical action.

If, after having exposed an engraving to strong sunshine for an hour, it is placed for twenty-four hours in contact with a piece of cardboard which has been kept in total darkness for some days previously, the absorbed light will be communicated from the engraving to the cardboard; and if this cardboard be now placed for twenty-four hours in contact with a sheet of sensitive paper, the result will be a reproduction of the original engraving. The paper may be impregnated with some substance which is more absorbent of the solar radiation, and then the above experiments can be performed with a much less exposure to light. A solution of either nitrate of uranium or tartaric acid will answer this purpose. If a design be traced upon cardboard with one of these solutions, and, after insolation, applied to a sheet of sensitive paper, the image of the design will be imprinted in a

much more vigorous manner than in the former experiments.

The following is perhaps the most curious and important experiment of all. A sheet of cardboard is very strongly impregnated two or three consecutive times with a solution of tartaric acid or nitrate of uranium, and then exposed to sunlight. After insolation, the interior of a tin tube is lined with the cardboard, and then hermetically sealed. The tube will now preserve, for an indefinite period, the remarkable power of evolving, when opened, the chemical light which it contains stored up in it. At any future time when it is desired to continue the experiment, the tube may be opened; and after injecting a few drops of water into it so as slightly to moisten the paper, reclosed, and exposed to a temperature of about 120° Fahrenheit. On now applying the open end to a sheet of sensitive paper, there will be produced a circular image of the opening as vigorously as if the sensitive paper had been exposed to the sun. Moreover, if an engraving on thin paper be interposed between the tube and sensitive paper it will itself be copied.

The experiment succeeds but once; that is to say, the light seems to have entirely escaped from the cardboard, and to obtain a second image it is necessary to have recourse to a fresh insolation.

(To be continued.)

A Catechism of Photography.

THE CAMERA OBSCURA—(*continued*).

Q. What is meant by a lens?

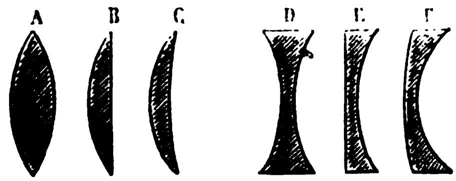
A. The term lens is given to a glass which has the property of converging or diverging the rays of light which pass through it.

Q. Of what material are lenses formed?

A. They are generally made of crown glass or flint glass; chiefly the latter.

Q. Are all lenses of the same description?

A. No; there are several varieties, distinguished from one another by their curvature of surface. Those which are thicker in the centre than at the ends are called *convergents;* those which are thicker at the ends than in the centre are called *divergents.*



In the above figure six species of lenses are represented. The first, A, is called *bi-convex;* B, *plano-convex;* C, *concavo-convex* convergent; D, *bi-concave;* E, *plano-concave;* F, *concavo-convex divergent.*

Q. What lenses are used in the photographic camera?

A. In the earlier experiments a single bi-convex achromatic was employed; but a combination of two achromatic lenses has since been adopted and is found to operate more perfectly.

Q. What is the meaning of achromatic?

A. The term is derived from the Greek, and signifies *void of colour.*

Q. Why are the lenses so called?

A. Ordinary lenses labour under the defect of giving images whose outline is variegated in colour, the achromatic lens is so constructed as to be free from this defect.

Q. Who was the first to construct an achromatic lens?

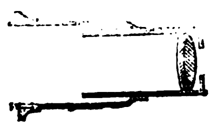
A. Achromatic lenses were constructed as early as 1733 by Mr. Hall, but his discovery was not published. In 1757 Mr. Dolland showed that by placing two lenses in juxtaposition, one bi-convex, the other concavo-convex, an achromatic lens might be produced.

Q. How are achromatic lenses now produced?

A. By the union of the two lenses, a concavo-convex divergent in flint glass (A) and a bi-convex in crown glass (B) as indicated in the engraving.

Q. How are the lenses adjusted to the camera?

A. They are contained in a brass tubing, and adjusting backwards or forwards by means of a rack and a tooth (*see fig.*) until the correct focus is obtained.

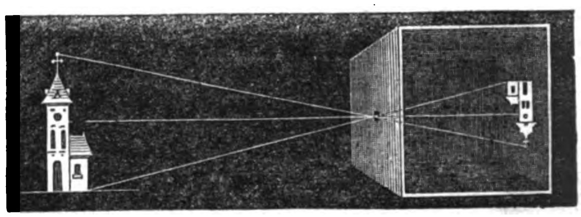


Q. What do you mean by the focus?

A. The focus is the point in which the rays of light from any object meet; practically, an object is said to be in focus when a sharply defined image, complete in every part, is thrown on the glass screen.

Q. Are not the images thrown on the screen inverted?

A. Yes; the inversion of the image arises from the fact that the luminous rays cross each other in passing through the lens, therefore the highest point of the object falls upon



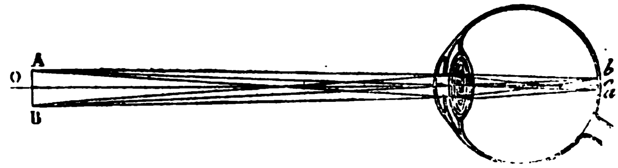
the screen at the lowest point, and the image is inverted, or upside down.

Q. Does not the same phenomenon occur in the human eye?

A. Images formed on the retina of the eye are all reversed, precisely in the same way as they are seen on the ground glass of the camera.

Q. How is it, under these circumstances, that we do not see objects reversed?

A. Various theories have been put forth to explain the phenomenon, but none of these are altogether satisfactory.



The accompanying diagram may be studied with advantage. The rays of light from an object marked A, O, B, pass through the crystalline lens of the eye, and form an image on the retina *b*, *o*, *a*.

III.—LIGHT.

Q. What is light?

A. Light is the agent which produces on the retina of the eye the sensation of vision.

Q. What theories are held respecting the origin of light?

A. Two theories have been entertained with regard to this subject, namely, the emissive, and the undulatory.

Q. How do these theories differ from each other?

A. The emissive theory is, that luminous bodies emit in all directions an imponderable substance, propagated in

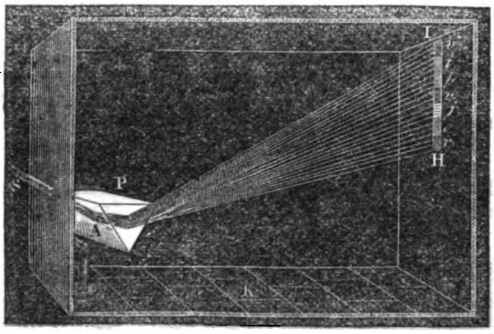
straight lines, and travelling with immense velocity. The undulatory theory is, that the particles of luminous bodies are animated by a vibrating motion, communicated to a subtile and elastic fluid diffused throughout the universe, and called *ether*.

Q. Is a ray of white light simple or compound?

A. Every ray of white light is composed of other rays of coloured light.

Q. How is this fact ascertained?

A. If a ray of white light is passed through a prism, it is immediately decomposed. This may be shown by admitting a ray of white light through an aperture in a window shutter into a darkened chamber, and causing it to fall on a prism A P, as represented in the annexed diagram. The ray of light (S), thus entering, forms on a screen (J) an oblong image, called the *solar spectrum*, and divided horizontally into seven coloured spaces or bands, succeeding each other in the order represented:—red, orange, yellow, green, blue, indigo, violet.



Q. Are these colours of equal brilliancy?

A. No; the red at the lower extremity is very faint, but increases in brightness as it approaches the orange; the brilliancy of the light still increasing, is brightest in the middle of the yellow, from which point it gradually declines, passing through the other tints in succession.

Q. Are these seven colours simple or compound?

A. They are simple colours, and thus, after passing through a second prism, the red, yellow, blue, and other rays remain identically the same.

Q. What are the properties of the solar spectrum?

A. In the rays of the solar spectrum three properties are distinguished, the illuminating, the calorific, and the chemical.

(*To be continued.*)

Correspondence.

TO REMOVE SILVER STAINS.

Newcastle-upon-Tyne, *September* 11*th*, 1858.

SIR,—I think it will be "news," and perhaps *good news*, to some of your readers, to be informed that silver stains on the hands may be very quickly discharged, by means of a solution of cyanide of potassium and iodine: 10 grains of iodine, ¼ ounce cyanide of potassium, and 1 ounce water form a very efficient mixture, incomparably more energetic in its action than the simple cyanide solution. It acts so rapidly, that there is not time for the skin to imbibe the poison in hurtful quantities, even supposing, of course, that immediately the stains disappear, or even before they quite disappear, the hands are carefully washed in several changes of water.

But some do not like cyanide, because it is dangerous; they may clean their hands by washing them in a creamy mixture of water and powdered chloride of lime. This method has the disadvantage of being less rapid than the former, and of giving an unpleasant odour to the hands. I have sometimes used hyposulphite of soda after the chloride, this, in some degree, subdues the smell. I think it a good plan to wash the hands with water *before* applying the cyanide mixture, and any very intense stains should be washed with a piece of wet sandstone, or pumice.

I trust these suggestions may contribute toward cleanliness in the practice of photography.

I am, sir, your obedient servant,
J. W. S.

W. Crookes, Esq.

PRINTING IN CARBON.

SIR,—I observe that in your notice of new discoveries, you attribute to *MM. Henri Garnier* and *Alphonse Salmon* a process which it appears to me sufficiently ridiculous to dub "Printing in Carbon," but which you assert does not differ in principle from those of *Mr. Pouncy* and *M. Testard de Beauregard*; of the principle of the latter gentleman I know nothing. My process is my own secret, and, I can assure you, bears not the slightest resemblance to that you are supposed to describe. I am prepared, however, to show you "perfect pictures" produced by my process, which will bear comparison with silver prints from the same negative. Can more be desired at present?

I am, sir, yours respectfully,
JOHN POUNCY.

Dorchester, *September* 13*th*, 1858.

[The article in question was translated from our French contemporary *Cosmos*, and the opinions there given are those of the editor of that paper. We do not know the details of Mr. Pouncy's process, neither have we seen any recent specimens, and should be very pleased to see some of the positives Mr. Pouncy alludes to, both carbon and silver; and if they really are as good as he states, we shall not be backward in giving him the credit of one of the greatest discoveries photography has ever known.—ED.]

Miscellaneous.

PRIZES FOR SUBJECTS RELATING TO PHOTOGRAPHY.—The Industrial Society of Mulhouse has proposed, amongst many others, the following subject for a prize:—"To bring into commerce at least five hundred kilogrammes (about half a ton) of paper, having all the necessary qualities for photographic purposes." The prize will be a gold medal of the value of one thousand or of five hundred franks (£40 or £20), or a silver medal, according to the importance of the subject. Everything must be delivered before February 15th, 1859. The Society will send a programme containing full particulars to any one who wishes for them.

A PHOTOGRAPHIC ACCIDENT.—As M. Courtais, a photographer of Bordeaux, was a few evenings ago engaged in his laboratory, a bottle of sulphuric ether suddenly burst, and igniting at a candle set fire to his clothes. In a short time he was enveloped in flames, and rushed down stairs, where some persons extinguished the fire. He was, however, so horribly burned that he expired the next day.

AMONG the tourists who have been exploring Brittany this summer, we hear of one party, the members of which were lately doing so "with a purpose,"—namely, the production of a book illustrated by photographic drawings. The party in question consists of the Rev. J. M. Jephson, Mr. Lovell Reeve, and a photographic staff. This party, as we are informed, landed at St. Malo, and after encircling, as it were, the ancient province, began their way homeward through the centre of Brittany. They will bring home with them above a hundred first-class stereoscopic pictures, including cathedrals, calvaries, crosses, castles, antiquities, landscapes, fountains, old houses, streets, costumes, and some of the great Druidical monuments still to be seen along the coast of the Bay of Morbihan. Such a party must have encountered droll incidents by the way, and when they entered a town with tent and apparatus, were probably often mistaken for acrobats or Thespian strollers.—*Athenæum.*

Photographic Notes and Queries.

WILL GUTTA PERCHA BATHS INJURE NITRATE OF SILVER.—SUNNING THE NITRATE BATH.—PREPARATION OF OXIDE OF SILVER.—RECOVERY OF SILVER FROM OLD BATHS.—QUERIES ON FOTHERGILL'S PROCESS.—TESTING THE PURITY OF HYPO.

Darlington, 6th September, 1858.

DEAR SIR,—I am induced, from your inviting announcement, to ask a few questions on subjects of general interest to amateur photographers.

Are gutta percha baths injurious to nitrate of silver solution? Is it absolutely necessary that a nitrate bath should be kept entirely from the light, as advised by some, while others actually recommend exposing it to sunshine to correct it when out of order? How would you prepare oxide of silver (in an easy way for an amateur who is no chemist) as recommended by Mr. Thomas, for adding to a freshly-made bath to bring it to a normal state? Do you add the most precipitate or the solution? Will it keep any time, or must it be made fresh as required? In recovering silver from old baths by carbonate of soda, must the precipitated carbonate of silver be kept from the light during washing? Will the iodide of silver, supposed to be present, require any special treatment?

Undoubtedly there is nothing the photographer uses which requires more proper management than his nitrate bath, and amateurs are often much harassed by conflicting instructions. A few hints from an authority like yourself are much needed to settle the points.

I am amazed at the great sensibility of plates prepared by the "Fothergill" process. One drawback seems to be its liability to solarize. Can you suggest a remedy? Here again Mr. Keene, its excellent populariser, advises a plate (stereoscopic size) to be washed with *four drachms* of water. Mr. Ackland's modifications, published on the 1st instant, recommends *eight ounces*. Now, it is evident to any one who knows nothing of chemistry, that there must be an immense difference between one plate and the other; if four drachms is sufficient to prevent stains, &c., eight ounces must reduce the quantity of silver on the surface very much—hence less sensitiveness. Is there any means of testing hyposulphite of soda? I have, unfortunately, a quantity by me very inferior. I made a toning bath (Hardwich's formula), and, on adding the gold, no milkiness took place. I added a second quantity (soda), but it still refused to turn; and, on standing a few days, the gold was precipitated to the bottom. Can it be made available?

CAUSTIC.

[1. There are conflicting opinions amongst eminent photographers as to the injuriousness of gutta percha baths. Some complain, that if the solution of nitrate of silver be kept in them for many days, they cause fogging of the pictures; others, on the contrary, give instances of their negative bath having been kept in gutta percha for weeks and months without any injurious effect. Our opinion is that gutta percha differs in quality, some samples producing fogging after a very few days' contact with nitrate of silver, whilst, in others, negative baths have remained for months without injury. We have no means of discovering beforehand whether a gutta percha bath will injure the solution. Mr. Sang states, that Dr. Young having long observed the injurious nature of gutta percha, renders it innocuous by coating it thickly with shell lac. The lac is dissolved in spirits of wine, at the rate of about 120 to 180 grains of lac to the ounce of spirit (much thicker than ordinary varnish). The vessels are to be well cleaned and dried, and the solution then poured in and out again. A sufficiently thick, and beautifully enamelled coat is thus left spread over the interior of the vessel, which is dried in a moderately warm place, free from dust. Mr. Wellwood states, that the injurious effect of gutta percha vessels arises from there being a film of oil imparted to the outside during the process of manufacture. This may be got rid of by filling the vessels with a strong solution of caustic potassa, and afterwards rinsing them out with nitric acid, and well washing.

2. *Sunning* the nitrate bath will correct it very well in *some* cases, but not in others. A bath that is in good order will frequently be entirely spoiled by exposure to the direct rays of the sun. Very little is known on the subject; and some experiments of our own, made with a view to find out under what circumstances sunning would cure a sick bath, have hitherto given very contradictory results.

3. Oxide of silver may be prepared by adding an aqueous solution of caustic potassa to nitrate of silver solution, until a brown precipitate is no longer thrown down; this is oxide of silver, and it must be thrown on a filter, and washed until the water which runs from it has only the faintest alkaline reaction. Oxide of silver may be also prepared by boiling chloride of silver with potassa solution; but many precautions are necessary to insure a complete decomposition, and the process is not so easy as the above for one who is no chemist. The oxide may be kept for any length of time in the dark, in a well-stoppered bottle; and, for correcting the acidity of a bath or other reactions, will be found more convenient if kept in the moist state. The precipitate itself should be used, as the solution would be far too weak for practical purposes.

4. Yes; the carbonate of silver will otherwise be decomposed. You may safely neglect taking any special notice of the iodide present, it will have no injurious effect on the result.

5. Try a grain of bromide of cadmium in addition to the iodide in the collodion to prevent solarisation. A plate washed with four drachms of water will be more sensitive, but will not keep so long as if more water were used. We should be rather inclined to err on the safe side, and use a larger quantity of water.

6. The account you give of the way your toning bath behaved does not prove the hypo. to have been impure; the fault might have been in the gold. What salt did you use? Was it *chloride of gold* or *sel d'or*? The latter is sometimes adulterated to the extent of 100 per cent. The precipitate you call gold, was, in all probability, sulphide of silver.

7. Hyposulphite of soda may be tested in the following manner:—Weigh out ten grains of iodine and twenty grains of the hypo. to be tested. Dissolve the hypo. in half an ounce of water, and add to it the iodine in fine powder; allow it to stand for about ten minutes, shaking it frequently during that time. If the hypo. be pure, the iodine will have entirely, or nearly, disappeared, and if impure, some of it will be left as a black powder at the bottom; the amount of impurity in the hypo. will be in proportion to the amount of iodine left undissolved.]

TRANSPARENT STEREOSCOPIC VIEWS ON GLASS.

Sir,—I shall feel obliged if you will kindly state in the "Photographic News" by what process views on glass (stereoscopic landscapes) are obtained, as I can find no directions for obtaining them in "Hardwich's Manual of Photography."

Yours obliged,
J. C.

[We believe that a really good process for producing these pictures equal to those of Ferrier or Soulier has not been published. We have succeeded in getting them *nearly* as good by means of the collodio-albumen process, exposing the sensitive plate to gas-light under a negative, for a minute or so, and then developing with gallo-nitrate of silver. Dr. Hill Norris's plates, prepared according to his dry process, may also be used, or, in fact, any of the dry processes. We suspect that Soulier and Clouzard produce their beautiful stereoscopic transparencies in the following manner:—A pair of 8 × 10 negatives are taken in two cameras separated by desired distance; these are then placed side by side in a frame, opposite a strong light, and so arranged in a room that no light enters except what passes through the large negatives. A camera with suitable lens, &c., is then placed opposite, at such a distance that the image of the two negatives on the ground glass shall exactly occupy the space which the picture is intended to cover on the stereoscopic slide. The ground glass is then removed, and a dark slide, containing a stereoscopic plate, prepared by the *albumen process*, or some modification, is substituted for it. The plate is exposed, developed, and fixed as usual afterwards. Our reasons for suspecting that Messrs. Soulier and Clouzard use a process similar to the above are the following:—Some time ago we were examining with Professor Wheatstone several pairs of transparent stereoscopic slides, in size about 8 × 10 inches, and intended for use in his large reflecting stereoscope. One of these pictures was a well known view of Paris, and, during the examination, it was suggested to compare the effect of the large view in the *reflecting* instrument, with that of a small transparent view of the same city in the *refracting* instrument. On comparing one with the other, we could not help being struck, at first sight, with the curious coincidence of one or two objects in the same spot on each of the pairs. Closer examination, however, showed that the positives, though of widely different sizes, were from *the same negative;* passengers in the streets, boats on the river, horses and carts, were identical, and, if further proof were wanting, small imperfections and spots on the larger plates were detected, upon close scrutiny, in the small pictures. The identity of negatives could not be doubted. It then became a question of some interest as to which sized negative was the original. Were the small pictures reduced from an 8 × 10 pair, or were these larger plates magnified from a smaller pair? This could easily be discovered. The copy, whichever it might be, would show unmistakable signs of its being only a copy, in its unavoidable exaggeration of light and shade, and slight loss of the finer details in the shadows. Moreover, it would be almost certain to have, in addition to all the accidental faults of the original, some one or two of its own. These tests were applied to the two pairs under examination, and we soon found, unmistakably, that the large pair were from the original negatives, and the small pictures were reduced from these. We had now to decide as to whether the small positives were printed from negatives of their own size, or whether they were copied in the camera from the large negative. This was not more difficult to answer than the previous question. To be copied in the former way, at least three intermediate copyings would have been necessary, and photographers who have ever tried to produce a second negative from a positive, well know that after three copyings the exaggeration of contrast in light and shade must necessarily be very considerable. In the case under consideration, however, this exaggeration was only just perceptible; in fact, no more than would be the result of once copying, and as there would be very little advantage, and many disadvantages, in printing them from small negatives, we came to the conclusion, that the pictures were produced as we have described above.

One reason why they cannot have been printed from negatives taken direct from the view, is, that the view appears with the sides as in nature when looked at *through* the glass, with the picture side away from the eye, whereas a positive, printed by superposition, would have the right and left wrong when seen in that position. By being reduced from a large negative, however, the above desideratum can be produced, by placing the negatives with the picture side away from the camera.]

ACIDITY OF RAIN-WATER.

St. Mary's Rectory, September 7th, 1858.

Sir,—I am delighted to learn that the "new weekly journal of photography" is to be edited by such a veteran artist. Your name is a tower of strength. I feel that it would ill become me to make any suggestions to you, and I will therefore content myself with congratulating you on your admirable prospectus, which leads me to expect that your paper will be the *beau-idéal* of a literary and scientific journal.

Will you kindly inform me, at your earliest convenience, whether you think that rain-water which fell during the heavy thunderstorm we had here sometime ago, and which I am surprised to find has a distinct acid reaction, will be injurious in photographic operations? Also, can you explain the cause of this phenomenon? I always thought that rain-water was *pure*. Believe me, your sincere well-wisher,

W. W.

[The phenomenon noticed by our correspondent is a very curious one, and we are not aware that it has ever been before noticed by photographers. The cause is not difficult to understand. Possibly many of our readers will be surprised to learn that the atmosphere we live in is composed of the very same elements as the most corrosive acid known—nitric acid; the difference being that in the latter the elements, nitrogen and oxygen, are united *chemically;* whilst in the atmosphere they are merely mixed *mechanically*. Under some circumstances, however, these two elements are capable of combining together in the atmosphere, and producing nitric acid; and in the case mentioned by our correspondent the electricity which was present in the atmosphere acted as the combining force, each flash of lightning giving rise to a certain very small

quantity of nitric acid, which, being washed down by the rain, caused the acidity spoken of. Fortunately however, for photographers, an electric flash is only capable of causing the formation of the merest trace of nitric acid; for, had it been otherwise, and were electricity capable of acting towards nitrogen and oxygen as it does in many other cases known to chemists, at the first flash of lightning the atmospheric elements would rush into chemical combination, and the animated creation would instantly be burnt up in a sea of aquafortis.

With respect to the injury likely to be done to photography by using this rain-water, in some instances, such as preparing solutions, the acid would be in too small quantity to do any harm. For washing positive prints, however, it might be injurious, and for that purpose we should recommend the addition of a few drops of ammonia to neutralise the acid.]

SUBDIVISION OF A DROP.—MEDIUM TINTED BACKGROUND.

DEAR SIR,—Some tyros may be pleased to know that a half, or even quarter drop of solution of carbonate of soda, which is quite enough to effect a change in a bath, may be added by dipping a clean glass rod into the soda, shaking off as much as is not required, and then dipping it into the bath. With common nitrate, prepared after Mr. Ackland's version of Fothergill's process, I have obtained, by this method, an extremely active bath.

What background, that would prove of a middle tint in a positive, is the most preferable?

Trusting that an answer to the above query would be worthy of a place in your first-rate periodical,

I am, Sir, yours very truly,
H. H.

[1. A drop may be subdivided very conveniently by adding 10, 50, or 100 drops of water, and then taking a certain number of drops of this dilute solution; in this way homeopathic doses of nitric acid are given to a bath. We have heard it gravely recommended to add the 500th of a drop of acid to an 8 ounce bath!

2. Yellow calico comes out as a good medium tinted background in a photograph. An old yellow blanket will also give a similar tint. The best plan, however, is to have a light wooden frame made, about seven feet square, and on feet with castors, to admit of being easily moved. Both sides of this may now be covered with backgrounds of different tints. A fabric must be chosen wide enough to cover it without a seam, some common kinds of sheeting calico, for instance, and this must be stretched tightly over the frame, and secured at the edges with tacks. One side of this may now be coloured in distemper with some shade of olive or gray, and the other side with the same colour of a darker tint. This latter will be found useful when gray hair or light dresses are required to be copied.]

HOW TO COMMENCE PHOTOGRAPHY.

August 30*th*, 1858.

SIR,—As I am desirous to learn the photographic art, I would be glad if you will tell me what instruments and chemicals I shall require, and what will be their cost (about).

I am, sir, yours faithfully,
E. B. G.

[By all means avoid much apparatus *for the present.* Nothing can be more erroneous than to suppose that complicated appliances are required to commence the study, and the chances are that a beginner who starts at a considerable expense will, unless he have extraordinary perseverance and courage in overcoming difficulties, will in a few months give it up in disgust. Do not *on any account* begin with attempting portraiture by the collodion process, or you will never be a photographer; but commence with obtaining an insight into the laws and phenomena of the science by copying lace, leaves, ferns, &c., on paper by super-position, then proceed to the talbotype negative process, and *keep to it*, at all events until you are so thoroughly *au fait* at the process as to be competent to decide upon the merits of the waxed paper or any other paper process. Many of our first photographers have done some of their finest pictures by the talbotype process. After having acquired some little proficiency in processes on paper, you can then get a complete set of apparatus, for the relative value of which consult our advertising columns, and try the collodion process, with good chance of success.

In our catechism we are giving a regular course of instruction in the elementary principles of photography, by means of which the student will be enabled to acquire a thorough practical insight into the properties of light and its effects upon the compounds employed in the different photographic processes, and be led by simple and progressive steps to a complete knowledge of all the processes in common use. We cannot do better than advise E. B. G. to carefully study this department of the "PHOTOGRAPHIC NEWS," and trust to our guidance to make him a good photographer.]

REMEDY FOR FILM WASHING OFF.

DEAR SIR,—I wish your new journal every success. If you edit it with your usual tact and talent, I am sure it will be the "PHOTOGRAPHIC NEWS" in truth as in name.

I am in a sad fix. The film of collodion washes off the glass, and thus I lose many tip-top negatives. Can you prescribe a remedy?

Yours faithfully,
AN F. R. C. S.

[This is a fault which collodion is very liable to have, more especially the nearly colourless varieties. It can be avoided by preparing the pyroxyline at a high temperature (see answer to "Well-wisher," No. 1, p. 11); and, in some cases, by dissolving about a grain of white wax in an ounce of collodion. Roughening the edge of the glass for about an eighth of an inch all round with a piece of coarse emery paper, or scratching it with a file, will also prevent the film washing off. The film also acquires a great tendency to wash off if much time has been allowed to elapse between developing and fixing; or if, after fixing and partial washing, the plate be allowed to become nearly or quite dry before the final washing be given to it. The film of preserved plates also has a great tendency to separate from the glass, occasioning what is called *blistering.* For this latter, no certain remedy is known. When the plate has become dry under any other circumstances mentioned above, the washing off may be prevented by applying a little spirit varnish, for about an eighth of an inch round the edge of the film.]

ANSWERS TO MINOR QUERIES.

Coloured Backgrounds.—*D. H.* asks how the beautiful coloured backgrounds, violet, brown, green, &c., are produced on glass positives. A very good plan is to put a perfectly black background behind the other, so as to have a transparent ground on the glass plate. When the picture is quite dry and ready for mounting, place a piece of good thin paper on it; and holding them together, opposite a strong light, trace the outline of the figure on the paper. Now colour the paper black where the figure is, and the other part the desired colour, and mount it behind the glass positive in the frame. Another plan is to paint the plain side of the glass, in the above manner, instead of using paper, putting black behind the figure as before. The picture can be coloured as usual on the front.

Queries on the Collodion Process.—*J. Jones.*—To take a negative portrait in from five to ten seconds, in bright weather, to be sufficiently dense to print from, is not at all a difficult matter; indeed, with anything like a good portrait lens, that would be a long time to expose the plate under favourable circumstances. The formula for your bath is the one in general use.—What is it kept "slightly acid" with? Acetic acid should be used in preference to nitric acid. The lens, a combination of $2\frac{3}{4}$ inches and 8 inches focus, ought not to be a slow one; so we conclude that you have either a bad collodion or incorrect formula for developing solution. For the latter, try:—

Pyrogallic acid	1	grain.
Glacial acetic acid	10	minims.
Alcohol	10	minims.
Distilled water	1	fluid ounce.

And, for the former, use Ponting's, Hardwich's, Thomas's, or, in fact, any respectable well-known maker's collodion.

Preserved Plates for the Positive Process.—*J. T.* is desirous of knowing how collodion plates may be preserved, so that a good positive may be obtained after being kept for some time. There are great difficulties in the way of taking good positives by any dry collodion process. A thin film of reduced silver is nearly certain to form all over the plate during development, and this, of course, would spoil a positive, although it would be of no consequence in a negative. We have not been able to succeed in taking even respectable positives owing to this cause, except by the original keeping process with nitrate of magnesia. This salt, being without action upon the nitrate of silver on the surface, does not give rise to decomposition, whilst plates prepared with any organic body, viz., honey, gelatine, albumen, &c., are nearly certain to decompose on the surface if free nitrate of silver be present. The best chance of success would be afforded by washing *all* the free nitrate of silver from the film of iodide before applying the preservative solution, but the plate would then be wanting in sensitiveness, and, consequently, hardly applicable to portraiture.

To obtain Density in Negatives.—*A Bungler* cannot obtain sufficient density in the high lights of his negatives. Try the following plan:—It will generally be found that a collodion iodised with iodide of potassium turns red on keeping, and then will only give pictures deficient in half tint, and of great density in the high lights; whilst, on the other hand, a collodion made with cadmium salt has, if anything, the opposite fault, viz., too much half tint, and insufficient vigour in the brightly illuminated parts of the picture. Choose a sample of red collodion which gives intense black and white pictures, and add it to the cadmium collodion in the proportion of two or three drachms to the ounce of the latter, trying the effect after each addition, until the desired balance, between intensity and half tone, is obtained. [We are obliged by your courteous offer of information to a "Photographic Artist." If you will send a letter to us on the subject, we will forward it to him.]

Queries on the Nitrate Bath.—*A Subscriber* has two baths, both of which worked well at first, but they have since got out of order. One of them leaves the surface of the plate greasy, so that the developing solution will not run over the plate properly, and, consequently, produces streaky pictures. The cause of this is, evidently, that the bath is too old, alcohol and ether having accumulated in it in too large quantities. It is very doubtful whether it can ever be properly mended. Try to evaporate the spirit from it by pouring it in a pie-dish, covering it with a piece of paper to keep dust out, and putting it in the oven or on the hob for an hour or two, and then adding water to make up the loss from evaporation. This may cure it, but it is a dangerous remedy, as the action of heat on the ingredients is very liable to generate a fogging tendency: if so, try if a drop of acetic acid will remedy it, and if not, we cannot help you; nothing is to be done but precipitate it, and obtain the silver from it. The second bath gives foggy pictures. Try a drop or two of acetic, or a fraction of a drop of nitric acid, that will most likely remedy it.

Views for Photographers near London.—Negative developing Solution.—*D. E.* intends spending a day in the country for the purpose of taking a few stereograms, but is at a loss to know where to go. He is only able to spare one day—starting in the morning and returning in the evening—consequently the locality must be within very moderate distance from London. We would suggest somewhere in the neighbourhood of Muswell Hill or Hornsey. A short journey by rail would bring him to Virginia Park, Windsor, which is one of the prettiest spots we know near London. We must confess great ignorance, however, on such matters, and should be obliged if some of our correspondents would favour us with their suggestions. A list of all the spots worth visiting with the camera situated within an hour's journey of London would be of great interest.—We know of no better developing solution than the ordinary pyrogallic solution for general work. We have lately been employing the following, but hardly know yet whether to recommend it or not:—

Sulphate of iron	12	grains.
Acetate of soda	6	grains.
Glacial acetic acid	½	drachm.
Alcohol	½	"
Water	6	"

It will bring out the picture after less exposure than pyrogallic acid, but we have sometimes not succeeded in getting sufficient vigour, and it is very liable to stain.

TO CORRESPONDENTS.

Aspirant.—Bromide of cadmium is a definite compound, and may be purchased at most respectable shops where photographic chemicals are kept.

A very Young Beginner.—Acetic acid in the bath may be neutralised in exactly the same way as nitric acid, remembering only, tha as it is a weaker acid correspondingly less of the carbonate of soda will be required.

A Tyro.—We cannot recommend any particular kind of collodion. The second you mention is very good, and may be obtained by ordering it of most dealers in photographic chemicals.

Hopeful.—The fault in your negatives seems to be too little half tone, and to remedy this, we advise a nearly neutral bath and colourless collodion. [See answer to "Bungler."] The printing is not at all good. Your fixing bath seems to be too old and acid, and the pictures you have sent will fade in a few months; try a fresh hypo bath.

Received too late for notice in this number.—M. D.—T. W. C.—W. H. H.—Photographer.—F. C.—Amateur.—E. C.—Focus.—G.—P. F. P.—A Subscriber.—One among the many.—An Amateur.—Enquirer.—A Subscriber at Norwich.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, Belle Sauvage Yard. Private letters for the Editor, addressed to the office, should be marked "private."

Letters to be answered in the current number of the "News," must reach the office not later than Tuesday morning.

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 3.—*September* 24, 1858.

MR. FOX TALBOT'S NEW DISCOVERY: PHOTOGLYPHIC ENGRAVING.

THE subject of engraving steel or copper plates by means of photography, is one which has deservedly attracted the attention of the leading men of science both in this country and on the continent.

There have been many experiments, in which, although none were quite satisfactory, there was separately demonstrated the practicability of the idea. In every attempt, indeed, however short it might fall of *desirable* perfection, there were the elements of future success, and sufficient grounds for self-gratulation on the part of the experimentalist.

They were all very wonderful, inasmuch as they were the first realisation of a great idea. But there yet remained the great objection that there was a deficiency of half-tone, and a mealiness, so to speak, in the pictures produced by these processes. It may be in the recollection of many of our readers, that there were several specimens at the Exhibition of the Photographic Society at South Kensington; those chiefly consisted of copies of war pieces by the celebrated Horace Vernet. Besides these, there were photographic copies by Richebourg, and the contrast between the photographic engravings and the photographs was indeed striking. In the one the half-tones were all rendered in a beautiful manner; while in the other there was a manifest hardness, and a decided preponderance of white and black throughout the pictures. So astonishing, however, was the result of these first attempts, that the discoverer might well have felt satisfied with his success, and have allowed the engraver to add the finishing strokes.

We have recently been favoured with the inspection of some new photographic prints, or, to speak more correctly, *photoglyphic* engravings, executed by a new process, the result of experiments made by Mr. H. Fox Talbot. By means of his invention common paper photographs can be transferred to plates of steel, copper, or zinc, and impressions printed off afterwards with the usual printer's ink. Pictures to be copied by this process require to be positives, and should possess clear definition when looked at as transparencies. Of course faintly-printed photographs are more difficult to render than those which are more distinct, and, as a general rule, it will be found that positives on glass are, by this new process, best adapted for copying. In the case of rare engravings, nothing could be better calculated for multiplying copies, because these are always easy to copy in plain photography.

The plates engraved by this mode are indeed beautiful in themselves as photographs, and will bear strong microscopic inspection, the most minute detail being given with astonishing fidelity. Of course prints taken from them on paper have not quite the same delicacy and minuteness of detail, neither could this be expected.

We are as yet not permitted to give publicity to the details of the process, but we can say that the scientific facts upon which the process is based are among the most striking in photography, which, as our readers are aware, is an art fertile in singular novelties. The specimens which Mr. Talbot has favoured us with of this new branch of art are very beautiful. They are free from many of the imperfections which were so evident in former attempts, and the manner in which the half-tones are given is really wonderful; the specimens are of various subjects, showing the perfection which can be obtained in any branch of pictures. Even in these copies the detail is so fine that when a powerful microscopic power is brought to bear on them, we are enabled to trace the names in the shops in the distance, and easily read the play-bills in the foreground, and this in a picture only a few inches square, while the minuteness in architectural subjects is most remarkable. In a view of Paris there is all that can be desired in half-tones, and the perspective is almost as good as in a photograph.

To show the diversity of subjects illustrated by this art, we cannot do better than name some of the prints before us; "Bridge over the Moldau," Prague; this picture contains much detail worthy of admiration, although it scarcely has the same delicacy of half-tint which some of the other pictures have; this we apprehend arises from the mass of water, which occupies a large white space in the middle of the picture. "The Great Bell of Moscow" differs very materially from the preceding, and may be considered as one of the most successful of the series before us; the half-tones are perfect in their gradation, and by means of a high magnifying power we are actually enabled to decipher the inscription on the bell. "The Temple of Edfou," Egypt, one of Frith's views, is, even in an artistic point of view, almost equal to the brilliant photographs with which that eminent photographer's name is associated; but how much more permanent! "Court of Lions," Alhambra, Granada, is not so successful as others, but this arises, we imagine, from the defects of the picture of which it is the copy. The details on the capitals of the columns are rendered with much accuracy, although in the line of perspective this is less perceptible. "Palace of the Duc de Montpensier," Seville,—here we have a charming bit of architectural detail, and, at the same time, a careful gradation of tint. "The New Louvre," Paris,—this picture is lightly printed, and the dark shadows are marked rather strongly, while the foreground is more varied. The detail of the exterior is not so well defined as we have sometimes seen it in photographs. "The Gate of the Cathedral of San Gregorio," Valladolid, is a picture in every way adapted to display to the best advantage the photoglyphic art, as in the architectural detail there is an opportunity for showing the

accuracy, and, at the same time, the beauty of this celebrated building.

In conclusion, we beg to acknowledge, with thanks, Mr. Talbot's courtesy in thus making us acquainted with the results of this important discovery; and we have the pleasure of informing our readers that he has kindly promised us, for an early number of the "Photographic News," a full account of the process, together with an engraved plate, which will enable our readers to appreciate the beauties of this new art of photoglyphic engraving.

THE STEREOMONOSCOPE.*

BY M. A. CLAUDET.

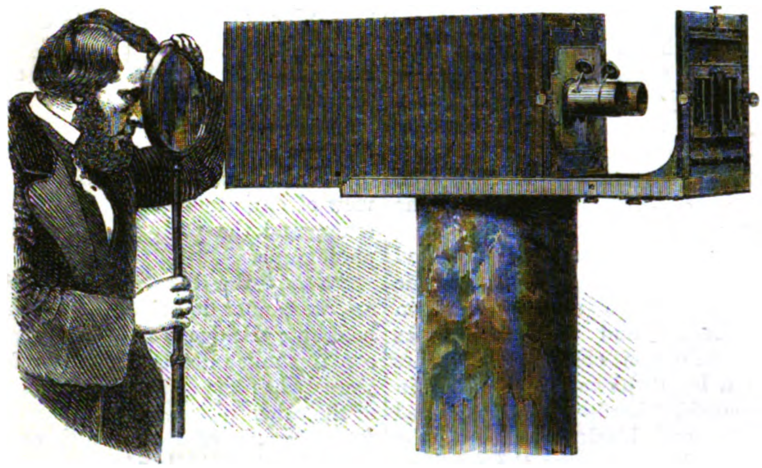
The difference between ground glass and paper, consists in this:—The process of grinding the glass does not destroy its transparency—it only disarranges the parallelism of the molecular surfaces, through which the incidental rays have had a free passage when the angles of refraction have coincided with the optic axis. Through these numberless molecular surfaces, each perfectly transparent, and acting like so many prisms or lenses, more or less inclined, each eye sees the rays, the incidence of which coincides with the optic axis. But the same eye cannot see those rays of another incidence which emerge through the molecular surfaces in the direction of the other eye. Consequently, each eye can only see the rays of which the incidence and the emergence fall perpendicularly on the pupil, and all the others are invisible to it.

It is not so in the case of paper, which, being entirely opaque, arrests all the rays which illumine it from behind. These rays, as if proceeding from self-luminous paper, diverge in all directions, and fall equally on the line of the optic axis, irrespective of the angle which they form with the surface of the paper.

All these investigations support the theory which explains the cause of the relief of the image produced on ground glass in the camera, and I do not think this theory admits of contradiction. It is evident that relief results from the presence of two superimposed images of different perspectives, each visible only to one eye, and invisible to the other; and that this phenomenon is the result of the property possessed by ground glass, of refracting through the transparent molecules of its surface all the rays which strike it, and that when their incidence coincides with the optic axis they are visible. But as each optic axis can only coincide with the incidental rays proceeding from the opposite side of the lens, the right eye alone sees the image refracted by the left side of the lens, and the left eye that which is refracted by the right side of the lens. Such is the real cause of the production of two images of different perspectives, which, although superimposed on ground glass, are not visible to both eyes at once.

The consideration of this phenomenon, and of the cause which produces it, suggested to me the idea of making a curious application of it, that should consist of the construction of an apparatus, in which two photographic images of different perspectives should be superimposed on the same ground glass, so that presenting to the eyes an image *apparently single*, this single image should produce the same relief or the same stereoscopic effect as we obtain in the common stereoscope.

Beholding for the first time so extraordinary an effect, without knowing the arrangement of the apparatus and its properties, we should not be able to conceive how an image, having the appearance of an ordinary picture, could produce the stereoscopic effect. Taking this into consideration, it appeared to me that, if I succeeded, I should solve a new and curious optic problem, the observation of which would surprise scientific men, while its practical application would prove a source of universal interest and pleasure. Accordingly, I set to work, and after the difficulties which generally accompany the realisation of any new idea, I obtained a greater success than I had dared to look for, in achieving the construction of the instrument I am about to describe.



THE STEREOMONOSCOPE.

[*Engraved direct from the photograph on wood. The process for obtaining which will be explained in an early number.*]

I have called it the "Stereomonoscope," not that I wish by this word to have it understood that, in reality, one single image could produce the stereoscopic effect (such an assertion would savour but little of science), but because I could not find a more concise expression, or one that would more clearly define the phenomenon resulting from an image which, in our judgment, we behold single, but which, nevertheless, offers all the peculiarities of relief that we obtain in looking at two separate photographic images, the visual coincidence of which can be effected either by the refraction of prismatic lenses, or by a certain degree of convergence of the optic axis.

This is the description of the stereomonoscope. As we shall see, it is, in fact, only an ordinary camera, to which two achromatic lenses are adapted. The camera should be sufficiently long to admit of extending the focus and amplifying the image at will.

The two lenses are each fixed on a frame, which slides horizontally by means of a groove. This admits of giving the necessary freedom to enable the two stereoscopic images

* Concluded from p. 15.

(placed before the camera) to be each refracted on the centre of the ground glass.

The two stereoscopic images are separately mounted, and can equally (each sliding in a groove) be placed before one of the lenses in the position the distance of the lenses requires. By means of screws adapted to the frames containing the lenses, and to those containing the images, we can gradually, and with the greatest precision, place them nearer or at a greater distance, to make the two images coincide on the ground glass, until they blend into one single image. The more you lengthen the focus, the more you must separate the images.

As in the ordinary stereoscope, when the two images are on glass, they must be lighted behind, and if they are on paper, or on daguerreotype plates, the light must be reflected on these surfaces.

The image of the stereomonoscope being represented on ground glass, in the focus of the camera, in order to examine it, we must prevent the ground glass from being lighted on the side of the spectator. Consequently, if we place the apparatus before a window, to light the two stereoscopic images by transmission, we must surround the aperture of the camera containing the ground glass with a large black screen, entirely hiding the window. The same black screen produces the desired effect, if the images are lighted by a lamp, to be seen at night in a drawing-room.

Besides the amplification of images, by lengthening the focus of the camera we may further amplify them, and at the same time augment the stereoscopic effect by placing a large convex glass before the ground glass, and by means of this convex glass (through another singular optical effect) the further we go from the ground glass the larger the image appears.

Thus the image can be examined as well at a distance as close at hand, and at a distance many persons can see it at the same time, without losing the stereoscopic effect, and without experiencing the fatigue that results from examining the ordinary stereoscope. Another great advantage offered is, that the spectators of this instrument are enabled to exchange opinions and to communicate the impressions they have simultaneously received from the spectacle before their eyes.

By inverting the order of the images placed before the camera the effect on the ground glass becomes pseudoscopic; but in looking with a pseudoscope, the effect becomes again stereoscopic. In like manner, if the images are placed before the instrument in their natural order, the stereoscopic effect on the ground glass becomes pseudoscopic, if we behold it with a pseudoscope.

Supposing we look at the image on the ground glass, closing one eye, it loses its relief, in the same way as when, in bending the head, we look with the two eyes placed on the same vertical line.

In short, all the phenomena observed on the natural image of the camera are presented on the image of the stereomonoscope, and they corroborate the truth of the principles on which are founded the theory of this new discovery—a discovery that must take its stand among the most astounding facts in optics.

TO CLEAN A GLASS PLATE.

At the last *séance* of the French Photographical Society a conversation arose respecting the best method of cleaning glass plates for photographical purposes. M. Paul Perrier stated that M. Bayard recommended that the glass should be fixed in a frame by means of a wooden screw, which is called in the Parisian photographical instrument shops, "*Un vis à nettoyer les glaces.*" The surface of the glass should then be washed with a mixture made with clean water and tripoli, strongly impregnated with nitric acid, then rubbed in a circular direction with a piece of flannel rolled up in a lump, and before letting the mixture dry the tripoli must be got off by rubbing the glass longitudinally with a second piece of flannel, and subsequently the glass should be rubbed circularly with another piece, and then if the glass be brushed with a badger's-hair brush, it will be found perfectly clean. M. Frank de Villecholes then stated that he cleaned his glasses without washing them either with acids or alkali (?), but with a mixture made with water, ammonia, and emery, and that after using this mixture he wiped them, and subsequently washed them with a mixture of alcohol and water. This method, he said, imparted to the glasses a perfectly clean surface. M. Arnaud stated that he preferred the following plan:—He put all his glass plates in the stone sink where all the washing water (containing cyanide of potassium) was poured. If the plate had been varnished, it should remain there for seven or eight hours; but if not, a very short time would suffice. When removed from this liquid the glass was merely to be rubbed with the hand, washed in a large quantity of water, and then wiped dry. When required to be used, it was only requisite to pour on it a drop of very pure alcohol, and then to clean it off with two successive pieces of *papier Joseph* (fine filtering paper).

Doubtless, either of these plans will bring about the "consummation devoutly to be wished." We have tried almost every imaginable plan, and must give our preference to some solution which we obtained of Mr. Warwick, 32, Sloane-street. A few drops of this preparation are to be applied to the surface of the glass, and after they have been rubbed smartly over the surface, the plate must be cleaned again with a piece of linen cloth, and finally polished with a leather. This takes hardly more time to perform than to read, and it really does its work in so perfect a manner, that, although we do not usually like to recommend secret preparations, we feel that to do so in this case will be to confer a boon on photographers in general. Since using it, we have never had a dirty plate.

New Discoveries.

THE PHOTOGRAPHIC VALUE OF THE URANIUM PRINTING PROCESS.

In the last sitting of the French Society of Photography, M. Humbert de Molard gave an account of some experiments he had made relative to the pretended unalterability of pictures obtained by means of the nitrate of uranium. M. Davanne afterwards presented proofs obtained through the same process by M. de Brebisson, and read a note on the subject which we reprint below. These proceedings were followed by a very animated discussion on the subject of the new process, and we regret to state that M. Nièpce de St. Victor did not find many defenders. The adversaries of the new process were numerous, and their opposition was characterised by a considerable degree of bitterness.

Although we are far from sharing the too absolute opinions expressed, we cannot but acknowledge that the new process has not fulfilled the expectations entertained of it; thus it is now averred that with the nitrate of uranium proofs are as easily alterable as those obtained with the chloride of silver, and as a result have hitherto produced nothing very perfect.

The name of M. Nièpce de St. Victor is dear to photography, and no person will contest the multiplicity and importance of his labours; it is only to be regretted that his researches with respect to the properties of the nitrate of uranium have been proclaimed in such magniloquent terms. According to certain persons, the new discovery was a real revolution in photography; it ought to be adopted immediately, to the exclusion of all other processes; the proofs were magnificent, their unalterability perfect; boiling cyanide of potassium respected them; and aqua regia alone had the power of affecting them. What is now the result of all this trumpeting? A marked dislike of the new process; those who have tried it and who have not succeeded to the extent of their wishes declare it detestable; this is the angry expression of disappointment

of people who have been promised a mine of treasure to work, and who find themselves deceived; but this does not prove that the researches of M. Nièpce de St. Victor with respect to the nitrate of uranium are without very great importance; in our opinion the new process, when modified and tested by experienced photographers, may produce good results.

"The experiments which I have made (says M. Humbert de Molard) are only the complement of the communication which will be made to you in a few minutes, of the otherwise important experiments of M. de Brebisson. One thing which surprised me in the paper on the employment of the salts of uranium was the positive nature of the process. That which was stated of the unalterability of the proofs especially surprised me. The nitrate of uranium process is new, and on this account it ought to be received with favour. It cannot be known yet to what it may lead; but I must observe that those persons who have announced it as the *ne plus ultra* of photography are decidedly in the wrong. The proof I hold in my hand was given to me by M. de Brebisson. It was asserted that the nitrate of uranium resists the action of boiling cyanide of potassium: I submitted a part of the proof to cold cyanide, and in five minutes that part of the picture had disappeared. I submitted another portion to ioduretted cyanide, and it disappeared immediately. I employed successively hydrochloric acid, aqua regia, an aqueous solution of bromine, chloride of iodine, hyposulphite, and in fifteen minutes nothing remained of it. Ammonia alone did not deteriorate it; on the contrary, it improved it. In fine, I would not ask more than five minutes to destroy any proof taken with the nitrate of uranium. Having a desire to see how it would act in the camera, I operated on the surface of a large plate with a German quarter-plate object glass, and in four minutes I obtained these indifferent proofs; at present the nitrate of uranium process is worthless for negatives, while as to the much vaunted durability of the positives, it does not exist. For the rest, reflection should have suggested this result of the experiment. Whence arises the alterability of ordinary proofs? From the alterability proper to the salts of silver. Now to develop the nitrate of uranium proofs nitrate of silver is employed, and the salt of silver being the principle of destructability, it matters little whether it be employed before or after.

"Considering this process in reference to its novelty, we cannot discover in it anything absolutely new; it has, moreover, much analogy with that published by Herschel in 1842, under the name of *chrysotype*, and which differed from it only in the nature of the salt employed. . . . My conclusion is that the indestructability imputed to the nitrate of uranium proofs is a chimera, and that the process in its principle is not absolutely new, since that of Herschel led to the same result. Still, if it is not the *ne plus ultra* of photography, it may assist us in obtaining excellent pictures with time and experience. The process is good in this sense—that it is an addition to photography. I beg the Society to keep in sight the fact that M. de Brebisson and I engaged in these experiments with totally opposite views. He wished to demonstrate that great things might be accomplished by the new process, and he has succeeded. I, that there was no durability in it, and I too have had the misfortune to succeed."

The paper of M. de Brebisson was as follows:—"My experiments on the occasion of the discovery of M. Nièpce de St. Victor were made without any other instructions than those furnished by the photographic journals, which were very incomplete, and which I anticipated in my impatience to become acquainted with the advantages promised us. In my isolation I have not been well able to appreciate the value of the results I have obtained; to do so, I must have had some with which to compare them, and at this moment, even, I have not seen any nitrate of uranium proofs other than those I have myself made; consequently, I don't know whether they are equal or superior to others obtained by the same process. . . . Several members of the Photographic Society having assured me that any details relative to the experiments I have made would be received with indulgence, I forward to the Society some proofs with this note, not as models, but simply intended to illustrate certain observations which follow. . . . For the preparation of positive paper, I generally use a solution of 12 parts of nitrate of uranium to 100 of distilled water or rain-water. Although the employment of straw paper was recommended, I have been content with Saxony and Canson's negative papers, which are fine and thin. They wash more easily and divest themselves better of the salts of uranium and silver with which they are impregnated. I plunge the sheet of paper in the solution of the nitrate of uranium for about two minutes; sometimes I only impregnate one side of the paper, but that which has been entirely submerged appears to me to give the most vigorous proof. The paper thus prepared is less sensitive to the influence of light than that prepared with the chloride of silver. To make a deep impression upon it, a very vivid insolation under a very transparent negative is necessary. . . . It will be very difficult to obtain, through this process, a good proof by means of diffused light.

"The bath I prefer for the developing liquid, after numerous essays, is 3 or 4 parts of nitrate of silver in 100 parts of distilled water. This bath will serve until it is exhausted. I added to this solution some drops of acetic acid; but when it had been used for a few proofs the quantity of nitrate of uranium which mingled with it naturally made it very acid. I have developed one half of a proof in a bath containing 2 per cent of nitrate of silver, and the other half in a bath containing twice that quantity, and both presented the same intensity. . . . To remove the reddish colour which the nitrate of uranium generally gives, I add to 200 parts of water 20 to 30 parts of a solution of chloride of gold at 1 per 1000. The tone of the proof when plunged in this dilute solution speedily changes, and in two or three minutes it will have acquired a suitable degree of intensity. If the action of this bath is prolonged the tone becomes of a disagreeable blue-black. . . . However feeble may be the dose of nitrate of silver employed in the developing bath, there always remain portions of this salt in the substance of the paper, notwithstanding that the repeated washings and exposure to the light give it a reddish tinge. The principal advantage of the new process consisting in proscribing the fixing by the hyposulphite of soda—the salt so hurtful to the future of photography—I attempted other means of getting rid of the non-reduced nitrate of silver, or, at any rate, of neutralising its dangerous effects. Ammonia renders the washing more efficacious, but not complete. Water containing chloride of sodium did not altogether succeed, and at last I determined on trying a new solution of hyposulphite of soda at 8 per cent. I then placed the proof in water, which I renewed from time to time. . . . The development of the picture by means of the chloride of gold alone, or by the bi-chloride of mercury, yielded no satisfactory results, and I may almost say the same of the iron bath suggested as having been used by M. Haudoy with satisfactory results. Nevertheless, by putting about 20 parts of a saturated and acid solution of protosulphate of iron into 200 parts of water, I have succeeded in getting proofs of an agreeable bistre tone.

"I have also tried, after M. H. Draper, the positive paper impregnated with a solution of nitrate of uranium. The proofs, after a long insolation, were scarcely visible, and were of a reddish tone, and without vigour. I should not mention this, if I had not obtained by this process two rather curious effects of colouring. One proof, on paper thus prepared, plunged in a very feeble solution of chloride of gold, gave a picture of a yellow colour, inclined to orange; and a beautiful rose tint spread itself over another positive, after its immersion in a very extenuated protosulphate of iron bath.

"As yet I am afraid to pronounce upon the durability claimed for the nitrate of uranium proofs. Possibly the substances I used might not have been pure. It is, perhaps,

from this cause that I have found so many salts capable of assailing these proofs. Ioduretted cyanide of potassium has such an effect upon them, that characters traced on their blackest parts with a pen charged with this liquid become of a pure white, even before they are dry.

"If I may be allowed, in terminating this paper, to venture an opinion on the new nitrate of uranium process, I will observe that it offers great advantages by the simplicity of the preparation of the paper, by the easy development of the picture, and especially by the saving which results from the small proportion of nitrate of silver necessary. But the development is abrupt, almost unexpected, and would lead to frequent miscalculations. The picture that the light traces upon the paper is so decided, that one cannot tell the precise moment when the luminous action ought to cease. Hence an uncertainty, which makes success depend on chance. . . . ."—*Revue Photographique.*

Critical Notices.

THE PHOTOGRAPHIC EXHIBITION AT THE CRYSTAL PALACE.

FIRST NOTICE.

IT is a happy idea, on the part of the directors of the Crystal Palace, that in addition to the already long list of attractions, there should be added another item—in other words, a Photographic Gallery. This is as it ought to be. Photography has now assumed a very important position among the arts and sciences, and it is only fitting and proper that it should have appropriated to itself a court or gallery at Sydenham, and that in that court there should be a collection which should in every way be worthy of the importance of the art and the Palace. Fresh discoveries are being made every day, and every day we find out some new application of this wonderful art, whether it be a means by which we can the more easily detect a prisoner, or record the rapid flight of a cannon ball through the air. When first we heard of the idea of a photographic collection at Sydenham we thought that not only were the directors taking proper steps in regard to making the Palace even more attractive to the public than it is at present, and not only were they taking a course which must tend to increase their dividends, but that they were placing a means within reach of the photographic world of keeping a record of the progress which the art is daily making. We thought that it must be indeed a pleasing feature in the attractions of the Palace to the amateur or beginner in photography that here he might have an opportunity of consulting the best results of each particular "process," and thus be enabled to judge of the efficiency or inefficiency of any particular mode of development, and that in this way the Sydenham Gallery might become an object of constant interest not only to the amateur, but to the public, who, having no means of seeing the progress in the art except in the shop windows, and not feeling sufficient attraction or interest in a simple exhibition of photographs, they might, by the more frequent familiarisation of the eye with photographic progress, acquire a more widespread interest than they do at present.

These were some of the thoughts which occurred to us, we say, when we heard of a Photographic Gallery being about to be formed at Sydenham, and with every desire of being *au courant* in all that relates to photography, and that we might (as it is our desire and intention) keep our readers equally so, we proceeded last week to Sydenham for the purpose of inspecting "The Photographic Collection." We cannot but express disappointment at the almost entire absence of new pictures. It was to us by no means a new exhibition. Wherever we turned it seemed as though an old friend nodded to us, and that with an almost self-complacent air. Here we met with one whom we had first known at Manchester, and with whom we had afterwards renewed acquaintance at the South Kensington Exhibition; but not content with this, it again made its appearance in the Coventry Street Exhibition. This we had thought the culminating point of re-exhibition, but what was our astonishment to meet again with these old friends who seem to have retained (notwithstanding their exhibitive campaigns) all their juvenescence. The reader will be inclined to agree with us, that the least thing that could be expected, was some new pictures on the occasion of opening a Photographic Exhibition at the Crystal Palace.

Of course it may be urged that just at present there is some difficulty in obtaining new photographs; then why not delay the opening and wait until such time as they are obtainable? By all means let the present collection be replaced with something which shall reflect credit upon the Palace, and the art.

There is in the Crystal Palace Gallery, as far as regards light, arrangements for hanging everything which can conduce to a successful exhibition. The screen saloon principle we very much admired, and for such a gallery as that at Sydenham it is decidedly preferable. In the Art Treasures Exhibition at Manchester, the screen was used, but owing to the narrowness of the gallery the saloon principle, which was carried out in the picture galleries on a large scale, could not be introduced in the Photographic Gallery, as that portion of it which was appropriated to photographs was in such close contiguity to the orchestra that for three or four hours in the afternoon it was impossible to examine any of the photographs in the front of the screens, owing to the crowds who listened to the music. The saloon principle was admirably carried out at the fourth Kensington Exhibition, and it could not but strike the visitor how much it conduced to his comfort in examining the photographs, since it enables people to inspect the pictures in peace without that continual throng which is always passing behind them, when pictures are hung in long lines. The colour of the screens, which is a neutral or tea green tint, is admirably suited for as a background, and where there are spaces, which must necessarily occur now and then between the frames, it never obtrudes itself as more staring colours do, nor does it offend or strike the eye as disagreeable. It is worthy of notice how different is the effect here from that produced at Coventry Street, where there were dark rooms and bad light, and, to make things worse, a dirty looking background which gave a sombre appearance to the room that was anything but agreeable.

Of course those works which are new deserve our first attention, and amongst these we may mention Herbert Watkin's series of portraits of contemporaneous celebrities. These will no doubt prove interesting to the general public, who will be anxious to behold the lineaments of those about whom they may have heard or read much. Who, for instance, would not feel interested in seeing the portrait of William Howard Russell, the Crimean and Indian special correspondent of the *Times?* he who has certainly raised the profession of "special correspondent" to an enviable position; who has thrilled the world with wonderful descriptions, and astonished it with his keen observations. He is indeed the photographer of life as it is. With all the correctness of the camera does he transmit pen-and-ink pictures to paper, which make the blood of the reader circulate the faster by the wonderful power of his word-painting. We say, who is there, then, that would not feel a great desire to look on him as he really is, with his smiling face and patriarchal beard? None, we will venture to reply; and so might we say of each celebrity, who in the circle in which he moves is a centre around which many admirers revolve, be that circle political, literary, artistic, dramatic, or scientific. This portion of the Exhibition will at all times prove an attraction, though to speak of the pictures from a photographic and artistic point of view, we cannot say that we admire them much. We think that it will not be denied that generally the human face has some defect or other, which, as we have it constantly before us, we do not so readily notice; but the moment that the face is portrayed on the

glass or paper of a photograph, when there is the absence of that colour which hides what is here a perceptible defect, it is immediately noticed, and the photograph, though a good one, is condemned as being a bad likeness; another view is taken, possibly so as to exclude the defective part, and then we have what is termed a good portrait, which in reality is only half of the truth, but decidedly the pleasantest half, because it administers to the vanity of the sitters by the exclusion of what would be painful. If, then, this much can be said of ordinary plain photographs, what must be said of such exaggerated pictures as those of Mr. Watkins, where every one of the defects (which perhaps under other circumstances would hardly be noticed) is brought forward with faithful yet painful fidelity? To show that we are not taking too extreme a view of the case, we cannot do better than refer the reader to a hideous portrait of the eminent tragedian Mr. Barry Sullivan, which is here given with an alarming reality; all the smallpox marks which unfortunately that gentleman has on his face are here so exaggerated, that on inspection the face looks as though it were taken upon a coarse-grained canvas. Then there are other faces—for instance, those of Mr. Robert Bell, Viscount Combermere, Lord Palmerston, and many others—which look decidedly repulsive, but the portraits of those whom time has furrowed are the least able to bear exaggeration. All this series are given with a truthfulness free from flattery, which makes the human face appear anything but divine. The whole of these photographs are open to the above objection of exaggeration. Some faces do not suffer so much as others, but speaking generally we think it desirable that the size of these pictures should be smaller, and then they would be free from their most objectionable traits.

Photographic Chemistry.

CHEMICAL NOMENCLATURE.

(Continued.)

It is unnecessary that we should pursue this portion of the subject any further; we shall therefore turn from the spoken to the written language of chemistry. Instead of occupying space and time in inditing the names of simple bodies at length, it is customary to indicate them by a symbol; thus, As signifies arsenic, N nitrogen, S sulphur, &c. A combination of two letters is written by means of the symbols placed side by side without any stop between them; thus Na is the symbol of natron, the Greek for sodium, O of oxygen; Na O therefore signifies oxide of sodium; the formula of which is thus written, Na O. If several equivalents of a simple body enter in combination, the number is told by a small figure placed at the right of the symbol of this body, a little below it. $S\,O_3$ is the equivalent of the sulphuric acid formed of one equivalent of sulphur and three equivalents of oxygen. To indicate several equivalents of sulphuric acid, a figure is placed before the entire formula of that acid:—$2\,S\,O_3$ means two equivalents of sulphuric acid. The cipher placed to the left of a formula multiplies the entire formula until it meets with one of these signs— +, —, =, plus, minus, equal to.

A few examples will suffice to render the use of these symbols easy of comprehension. Example:—$Pb\,O + S\,O_3,\ H\,O = Pb\,O,\ S\,O_3 + H\,O$, signifies one equivalent of oxide of lead, *plus* one equivalent of sulphuric acid united to one equivalent of water (what chemists term monohydrated sulphuric acid), produce one equivalent of oxide of lead, *plus* one equivalent of water. $Cl\,O_5,\ K\,O - O_6 = K\,Cl$ means chlorate of potassa, from which six equivalents of oxygen have been withdrawn, leaving as residue chloride of potassium. $3\,S\,O_3 + Fe_2\,O_3 = Fe_2\,O_3,\ 3\,S\,O_3$, or $Fe_2\,O_3\,(S\,O_3)^3$ is understood thus:—three equivalents of sulphuric acid (+) *plus* one equivalent of sesquioxide of iron (=) produces one equivalent of sulphate of sesquioxide of iron. All photographers are familiar with the nitrate of oxide of silver, more commonly designated nitrate of silver,—an erroneous expression, but sanctioned by custom. The composition of this salt is as follows:—Nitrogen uniting with oxygen forms nitric acid; one equivalent of this acid contains one equivalent of nitrogen to five of oxygen. Silver combined with oxygen constitutes oxide of silver, which contains one equivalent of silver to one of oxygen. One equivalent of nitric acid united to one equivalent of oxide of silver, gives therefore one equivalent of nitrate of oxide of silver; or, in symbols, $Ag\,O + N\,O_5 = Ag\,O.\,N\,O_5$.

(To be continued.)

Dictionary of Photography.

Accelerating Agent.—A name given to those substances which hasten the action of the luminous rays upon a sensitive photographic compound. In the collodion process, accelerating agents are chiefly confined to substances to be added to collodion. The addition of a saturated solution of chloride of sodium has been suggested by Herr L. G. Kleffel, in the proportion of six drops to an ounce of iodised collodion: this mixture is to be shaken for five minutes, and then allowed to stand for twenty-four hours, that all the floating particles may settle. It must then be carefully decanted into a perfectly clean, dry bottle. This is said to greatly increase the sensitiveness of collodion when new, and also to restore, in a great measure, the sensitiveness of old collodion, which has deteriorated through age.

Mr. A. Maconochie has recommended the addition of two or three drops of an alcoholic solution of protoiodide of iron, to each ounce of a stable, iodised collodion. Positive collodion will be found to answer best for this purpose, as the greater tenuity of the coating of iodide of silver renders it easier impressible. The collodion, after mixing, can be used at once, but no more should be prepared than is wanted for immediate use, as it will not keep good longer than a few hours. Under some circumstances the outline of the picture can be traced on the plate after exposure, even before the developing solution is applied. In case the deposit of silver on the plate is not found to be sufficiently dense to print from, it may be strengthened by washing over the plate, after fixing and washing, but before drying, a dilute solution of terchloride of gold. This will be found to add considerably to the density of the picture when viewed by transmitted light; a deposit of metallic gold being precipitated on the silver already on the plate. By this means prints can be obtained from feeble negatives, as intense as if they had been good negatives from the first.

Mr. Parr has recommended the employment of acetate of soda as an accelerating agent in the nega-

tive paper process. He proceeds in the following manner. Canson's negative paper is immersed for three minutes in the following bath :—

Iodide of potassium	75 grains.
Bromide of potasium	25 „
Acetate of soda	30 „
Iodine	5 „
Water	10 ounces.

It is then to be hung up to dry. When required to be used, the paper is to be made sensitive in the following solution :—

Nitrate of silver	88 grains.
Glacial acetic acid	1 drachm.
Water	1 ounce.

Two drachms of the above solution are to be poured on a glass plate, and, after being distributed uniformly over the surface, a sheet of paper 9 × 7 inches is to be floated on it, until the dark purple colour has entirely disappeared. The superfluous nitrate of silver is then to be drained away, and preserved for developing, and the margins of the glasses blotted dry. The sheets of paper are now ready to be placed in the camera, the glass on which it has been excited serving to support it, and retain the moisture. The paper will keep good for several hours. After exposure in the camera, the image may be developed with gallic acid, the drainings from the sensitising process being added at last, if necessary. The remainder of the process is the same as that usually adopted; after the pictures are finished they may be waxed.

Acetate of soda may be used as an accelerator in the collodion process. 4 grains of dry acetate of soda, and 4 grains of iodide of cadmium to the ounce of collodion, give a strong impression in about the ninth part of the time of ordinary collodion, which is quite free from any symptoms of fogging. Collodion so prepared, however, will not keep more than a few hours.

(*To be continued.*)

[Press of important matter at the last moment has rendered it necessary to curtail the "Chemistry" and "Dictionary."—Ed.]

A Catechism of Photography.

LIGHT—(*continued*).

Q. What is known respecting the illuminating power of light?

A. From the philosophical researches of modern times it is shown that certain rays of light possess a more intense illuminating power than others. The maximum intensity of light is in the yellow, and the minimum in the violet.

Q. What is meant by the caloric property of light?

A. The intensity of heat which is shown to vary in the different coloured rays. It increases from the violet to the red. Some writers have fixed the maximum in the dark stripe which bounds the red, others in the red itself; but the difference appears to depend on the nature of the refractory prism.

Q. What are the chemical properties of light?

A. In addition to the illuminating and calorific powers in every ray of light, there is united another and perfectly distinct principle, as distinct from light as light is from heat. This principle is called actinism, and it has the power of decomposing chemical compounds.

Q. Is not this principle the groundwork of photography?

A. Yes; actinism is the grand principle of photography, as it is simply by the action of this principle on certain chemical compounds, that photographic effects are produced.

Q. May we not say that light exercises this influence and produces this effect?

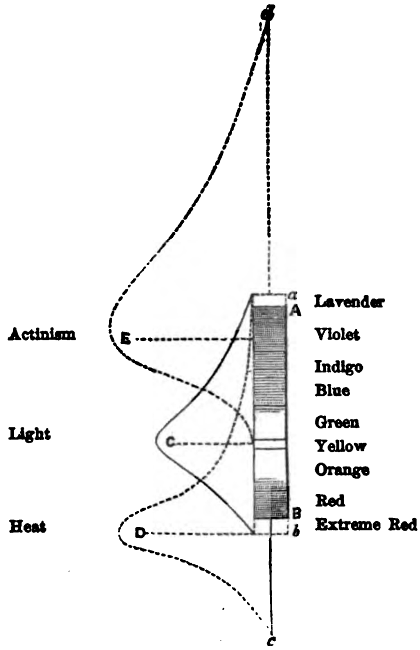
A. We may use the term light in a general sense, but it is not philosophically correct. It is not light, but only a component part of light, the influence of which is exerted in photography. A broad distinction should be made between light and actinism.

Q. Explain the difference.

A. White light consists of seven colours—three primary, red, blue, and yellow; and four formed by combination of these three—violet, indigo, green, and orange. Thus a ray of white light may be described as a bundle of rays, exercising different influences. Some of the rays giving more light than others; some of them giving forth more heat; and others—as the violet—exercising the greatest power in decomposing certain chemical salts having a metallic base.

Q. What is this called?

A. *Actinism.* Various terms have been suggested as appropriate to distinguish this principle, and that of *actinism* (from the Greek word *actin*, a ray), though open to some objection, is now generally adopted.



In the above diagram we have a representation of the threefold property of light. The shaded portion shows the colours as they occur in the decomposed solar beam, and the curved lines indicate the relative amount of actinism, light, and heat, the former of which is greatest at E, light being most intense at C, and heat greater at D.

Q. How can we assure ourselves that a *separate* chemical principle exists in the solar ray?

A. Because we can separate it from heat and light. There are certain media through which, if we pass a solar ray, one or two of its elements may be separated from the others; thus a ray of light passes easily through a transparent plate of alum, but nearly all the heat is absorbed. Certain dark coloured bodies allow nearly all the heat to pass and obstruct the light. A blue glass obstructs nearly all the light and heat of the solar ray, but allows the actinic or chemical principle to pass freely; while a yellow glass allows the light and heat to pass, but obstructs the passage of the chemical influence.

Q. When light is decomposed by a prism, what are the relative positions of these three different principles?

A. All these are refracted, but the *calorific* principle the least of any. Its maximum point is but slightly thrown out of the right line which the solar ray would have taken had it not been intercepted by the prism.

Q. How is the *luminous* principle influenced?

A. It is subject to a greater degree of refraction than the calorific principle.

Q. What is the position of the chemical or actinic principle?

A. The radiations which produce the chemical change are more refrangible than either the luminous or calorific principles. The maximum of this power is to be found at the point where light rapidly diminishes, and where heat can scarcely be detected.

Q. What curious fact was there elicited?

A. That no substance can be exposed to this actinic principle without undergoing a chemical change.

(*To be continued.*)

Correspondence.

SEA-SIDE PHOTOGRAPHY.

Ramsgate, September 20.

Dear Sir,—The first two numbers of the "Photographic News" have reached me in this paradise of photographers, nigger melodists, and donkey drivers, and I trust that photographers, both professional and amateur, will not be slow to perceive the advantages of possessing an organ of publicity which can be maintained at so trifling an expense to each, and calculated to be of such essential service to all. I am myself a photographer, though only an amateur, and, as such, have devoted myself almost exclusively to experimental researches; and for this reason have kept myself *au courant* with the photographic literature of the continent, and am, in consequence, deeply impressed with the *necessity* for a publication which will keep English photographers acquainted with the progress of the art upon the continent; and thus prevent any among them from again incurring the humiliation of announcing that as a discovery which has long been familiar among continental photographers, and at the same time prevent the latter from assuming all the credit of discoveries which may have been previously made here. Had the "Photographic News" existed three or four years ago, it is probable that Mr. Burnett would have then published his discovery of the extraordinary effects of light, and in that case further researches would undoubtedly have led to the discovery which has given so much celebrity to the name of M. Nièpce de St. Victor.

I perceive that at the commencement of this letter I have coupled photographers with individuals who are deemed somewhat low in the social scale; but the photographers I allude to may be termed the *Bohemians* of the profession—men who get their living by starting a shop for the sale of photographic portraits, without the most distant idea of the simplest principles of the art. In this town, where it appears to be as much the custom for the ladies who are staying here to have their portraits taken as to take a bath, these shops abound; and invitations to have one's portrait taken for sixpence, with a discount of 18 per cent. on taking a dozen, are numerous. Whether any ladies are so enamoured of the sight of their own pretty faces as to avail themselves of this opportunity of procuring numerous representations, or, to speak more correctly, *mis*-representations of their features at such a discount, I cannot say; but certainly out of a dozen there would be a *possibility* that one might still exist at the end of a week, which it is hardly likely would be the case if a less number were taken. As may be imagined, from the prices charged, the competition is very keen indeed; and I should not be at all surprised to see the imaginary placard of *Punch* realised, and an announcement to the effect that "a rasher of bacon and a portrait" might be had within for sixpence. The pertinacity with which these men insist on taking your portrait is only equalled by that of the proprietors of the bathing machines, who are so convinced that every man who walks on the sands in the early part of the morning requires a dip in the sea, that I have many times fancied myself in peril of being picked up, placed in a machine, and sent out to sea, and have with difficulty saved myself from such a fate by showing my dripping hair as a proof that I had just come out of it. They appear to entertain the same opinion of the veracity of the visitors as the clergyman did of his parishioners, who, taking for his text the words of David, "I said in my haste all men are liars," followed its enunciation by the meditative commentary—"Ay, David! you said that in haste, did you? If you had lived in this town you would have said it at your leisure." G. L.

MICROSCOPIC PHOTOGRAPHY.

Sept. 20th, 1858.

Sir,—I noticed in your first number of the "Photographic News" a communication respecting microscopic photography. The method I adopt for obtaining the same result rather differs from that there described; and as I have nowhere seen it mentioned, it may be useful to your readers if I do so.

I take the microscope, *without removing the eye pieces*, and fit a disc of cardboard round the tube, the outer edge of the disc also being made *to fit into my camera portrait lens*. Nothing now remains to be done but to adjust the microscope and camera (with lens) together, to focus on the ground glass, and substitute a prepared plate, developing in the usual way.

The light, I should have mentioned, may be obtained either from the mirror or condenser. By the above method, the necessity for pulling the two instruments to pieces is entirely avoided, and the object photographed may be increased to any size, only limited by the length of camera.

I am, sir, yours truly, C. B.

PRINTING IN CARBON.

Dorchester, September 18th, 1858.

Sir,—I have seen, and have to thank you for your notice of my discovery, and for the rectification of the error into which your French contemporary has fallen. It would serve me materially were there any means of inducing that journal also to take similar notice of the evident mistake in confounding mine and other processes.

I feel very much disposed to accede to your offer of testing the value of my discovery by the comparison of one of my *carbon impressions* with that of a *silver print* (here, allow me to ask you, if Mr. Fox Talbot's first or early prints, supposing some still existing, will bear comparison with photographs of the present day); and, notwithstanding that I had made up my mind, in consequence of what I considered as the unfair treatment of the Photographic Society, to avoid, for the present, any further discussion of the subject in London, it will afford me pleasure at once to send for your satisfaction (as I am confident the event will prove) a print of each kind from the same negative, that you may give your impartial and unbiassed verdict upon them; provided you will kindly undertake to authenticate both on the back by a private mark, which you can hereafter identify readily, and will return it to me on the completion of your investigation (say in a day or two). I fearlessly abide the result, knowing, that whatever improvements may hereafter be made, or whatever refinements some may consider my process requires, in comparison with others that have undergone fifteen years' experience, mine not having as many months, it is, at its present state of development, far more valuable than any that has preceded it. I am, sir, yours respectfully,

John Pouncy.

[It will afford us much pleasure to acquiesce in Mr. Pouncy's proposition. If he will forward us the prints, we will examine them, and at once give our readers a fair and impartial opinion as to their merits. We are fortunate enough to have one of Mr. Talbot's early prints, on plain salted paper, in our possession. It was taken, of course, from a paper negative fourteen or fifteen years ago, but we much doubt, if an unalbumenised paper positive were to be printed from the same negative to-morrow, whether any difference would be observed between the two. Some of the pictures in "The Pencil of Nature" will bear comparison with any modern prints.—Ed.]

Photographic Notes and Queries.

ECONOMISING WATER IN OUT-DOOR PHOTOGRAPHY.

September 14*th*, 1858.

DEAR SIR,—Will you kindly say, in your next issue, how I can do with the least possible quantity of water in out-door photography by the wet collodion process?

Yours, &c.,

A SUBSCRIBER AT NORWICH.

[This is a very important point for photographic tourists; for, if pictures of any size are attempted, and the whole operations of developing, fixing, and washing are to be performed on the spot, in a tent or *improvised* dark room, the amount of water required to be carried about is a serious addition to the weight of the necessary impedimenta of a travelling amateur photographer. Perhaps the following page from our own experience on this subject may be of use:—

We desired to obtain some small stereograms of scenery under circumstances which would render it necessary for us to carry the entire pack, camera, legs, tent, chemicals, and *water* ourselves; and, as it was clearly impossible to dispense with any of the former articles, we turned our attention to the water, and instituted a few experiments, with a view to ascertain how small a quantity would be necessary to use for each plate (the apparatus contained glass and chemicals for twelve pictures). Fixing and washing from the hypo. we soon found was out of the question—the amount of water necessary to take for that purpose being somewhere near a gallon; and as we had a decided objection to carrying about hypo at all, we tried whether the film could not be preserved from further change after the picture was developed. A very dilute solution of salt was prepared; and, as soon as the picture was developed, the pyrogallic solution was poured off, and the plate washed once or twice with the salt and water; it was then returned to the plate box, and after keeping for several hours in the dark, it was examined, and not the slightest deterioration could be detected. Upon pouring the fixing solution on, the picture was immediately cleared, and, when washed, the negative was undistinguishable from one which had been taken in the ordinary way. Weak salt and water answered very well for some time, and the quantity required was small enough to satisfy any one, not exceeding a pint for the twelve plates; but, in practice, a few objections arose from time to time which made it desirable to find out some substitute for the salt and water; the plates draining into the box soon contaminated the sides and grooves with salt, and this getting into the clean glasses dirtied them; moreover, whilst working in the almost air-tight tent out in the sun, with the thermometer at 130° inside, we often thought how nice it would be if we ourselves could, now and then, share the contents of the bottle with the developed picture. Pure water was next tried, and answered as well as the salt and water, without any of the drawbacks mentioned above; and, as we subsequently found, that a glass or two of sherry in a pint of water in no ways interfered with its photographic excellence—whilst it not only materially improved its quality as a beverage, but also caused the water to run more readily over the surface—we decided upon adopting the last-named mixture. The water was contained in an elastic india rubber bottle, into the mouth of which a narrow tube, with a very small orifice, might be adjusted, so that, whilst the water might easily be squeezed out in a thin stream on to the plate, upon removing the pressure, the elasticity of the bottle caused it to resume its proper shape, sucking the air in through this orifice. Whilst at work, the bottle might safely be laid down, and moved about any way without a drop of water being spilled, whilst for packing up, the tube could be pulled out and a cork introduced to make all secure.

The only drawback—and we wish some of our correspondents could suggest a remedy—is, that if many hours are suffered to elapse between this washing and the final fixing, the film seems, in some degree, to lose its adhesion to the glass, and thus, more than usual care is required in the fixing and subsequent washing, to prevent the film floating off; this, however, does not happen with those collodions which give a powdery film, owing to the pyroxyline having been prepared at a high temperature.]

BLACK AND WHITE POSITIVES ON ALBUMENISED PAPER.

Glasgow, 14*th September*, 1858.

SIR,—Your new work entitled the "PHOTOGRAPHIC NEWS" has induced me to write you on Albumen Positive Printing. I may premise I have been a reader of Notes and Queries, London and Liverpool Photographic Journals, Notes, &c. &c., from the first, and have endeavoured to pick up such formula as would, on albumenised paper, give me ebony black tone, but hitherto without success. I have got red, brown, purple, yellow, but never pure clean black. I confess to being a lover of positives on albumenised paper, and solicit your mature advice as to what additional step I should take to gain ebony black tones, with greater permanence.

I prepare and albumenise my own paper (using Canson and Marion's), with chloride of ammonium 10 grains, and then nitrate of silver 60 grains, with 2 drops of acetic acid to each ounce of solution. I print deep, and then immerse in pure water for five minutes, then in solution of strong hyposulphite of soda, with 15 grains of chloride of gold to the pint, adding (*per* Maxwell Lyte) 2 grains pyrogallic acid. I tone as deep as possible; finish in a fresh solution of hyposulphite of soda; wash for one hour in a running stream of water; immerse in a solution of soda, and two baths of warm water, then finish in a running bath of water for some hours, and then dry. What is superfluous; and what should I further do to gain my wished for colour, &c.?

In the *London Photographic Journal* for August 21st, 1855, page 210, I find M. Claudet gives a method for printing positives instantaneously by the bichloride of mercury, and developing with the protosulphate of iron. I have tried the plan, and occasionally get intense ebony black positives with 10 seconds' exposure. But this is not always the case; often the developing solution stains the front and back of pictures; other times the picture is gray, and the whites yellow. It was recommended to fix in the hyposulphite of soda, but this will not do, as the whole becomes a nasty yellow. This process, I do think, if properly carried out, would give pretty jet black pictures, but the want of chemical and photographic experience and knowledge prevents me knowing the errors in my way; your help is solicited.

AN AMATEUR.

[We think your process could be improved in some respects, and the chance of obtaining the tone you desire much improved. In the first place, we think that there should be at least 30 grains of chloride of ammo-

nium, and 120 grains of nitrate of silver to the ounce respectively; this gives greater vigour, and also makes the paper more sensitive. Do not over-print much, and wash all the free nitrate of silver away, first in pure water, and lastly in weak salt and water, before fixing. Tone, *before* fixing, in a bath of 2 grains of chloride of gold to five ounces of water, and *soon after* the desired tint is obtained, transfer the print to a new hypo. bath of about 1 part to 3 of water; *but how long after*, experience in the lowering effect of the fixing bath will soon show. After being in the fixing bath for a quarter of an hour at least, remove, and wash in the manner you state above.

We can promise to those who follow this plan, if not absolute black and white, at all events a *very* near approach to it. Respecting M. Claudet's process with perchloride of mercury, we have had no experience of it, and would gladly receive information on the subject from any of our correspondents who may be wiser than ourselves.

ARRANGEMENT OF THE TELESCOPE, &C., FOR ASTRO-PHOTOGRAPHY.

September 16, 1858.

Dear Mr. Editor.—I am a young photographic tyro, and seeing you have devoted a space to the answers of those who may choose to refer to you for advice, will you be so good as to give us some *intelligible* method of arranging the telescope and camera for taking heavenly bodies; something in the able manner in which the article on the microscope is treated in the first number, and oblige

Your well-wisher,
P. F. P.

[We trust that the following extract from a paper which the editor read before the Royal Society, "On the Photography of the Moon," will give the desired information. In speaking of the Liverpool equatorial we wrote:—

"The polar axis and telescope together weigh about five tons, and whilst all parts are so truly and smoothly fitted that this enormous mass is moved equatorially by means of a small water-mill with such marvellous accuracy, that a star viewed through it appears absolutely stationary, its firmness is such that a hard blow against the side merely produces a scarcely perceptible momentary deflection. The object glass is 8 inches in diameter, and has a sidereal focus of 12·5 feet—the diameter of the moon's image in this focus being about 1·35 inches.

"The eye-piece was removed, and in its place the body of a small camera was attached, so that the moon's image would fall on the ground glass or sensitive film in the usual manner.

"The clockwork movement was only sufficient to follow the moon approximately when on the meridian, but as the pictures were nearly all taken when the moon was some distance past the meridian, and when consequently the declination and atmospheric refraction were changing rapidly, it was necessary, notwithstanding the short time required to take the pictures, to correct for the imperfect motion of the telescope. This was done by means of slow-motion screws attached to the right ascension and declination circles, which are each 4 feet in diameter. The *finder* had an eyepiece of a power of 200 applied to it, having cross wires in its focus.

"The *modus operandi* in taking the pictures was as follows:—The telescope having been moved until the moon's image was in the centre of the focussing glass, the water-mill was turned on, and the dark slide containing the sensitive collodion plate was substituted for the ground glass. Mr. Hartnup then took his station at the finder, and, with a tangent rod in each hand, by a steady and continuous movement, kept the point of intersection of the cross wires stationary on one spot of the moon's surface. When the motion was most perfectly neutralised, I uncovered the sensitive plate at a given signal and exposed it, counting the seconds by means of a loud ticking chronometer by my side. From the ease with which on my first attempt I could keep the cross wires in the finder fixed on one point of the moon by means of the tangent rods, I confidently believe that with the well-tutored hands and consummate skill which guided this noble instrument, the moon's image was as motionless on the collodion film as it could have been were it a terrestrial object."]

CONVERSION OF GLASS POSITIVES INTO NEGATIVES.

Ashton-under-Lyne, Lancashire.

Sir,—I should feel much obliged, through the medium of your "Photographic News," if you would give me your opinion on the system of converting glass positives into negatives by pouring on bichloride of mercury, and when well washed, pouring over hydrosulphuret of ammonia.

I have taken in the first number of your new "Photographic News," and find it very instructive. Hoping to see this answered under "Correspondents," I remain, sir,

Yours truly,
S. P. Q. R.

[We do not think the plan mentioned by our correspondent is worth much—it merely *darkens* the deposit as seen by reflected light, but does not much increase the opacity. The same may be said of the plan with chloride of gold. Far better is the method proposed by Maxwell Lyte, by whitening the picture in the usual way with the solution of perchloride of mercury in hydrochloric acid, and then, after well washing, pouring on a two-grain solution of iodide of potassium. The great advantage of this method is that it is *accumulative*, and by alternately treating the plate with these solutions any degree of intensity may be obtained. An equally good way is to re-develop the positive with the negative developing solution, after fixing in *cyanide* and well washing. In this way fresh particles of silver attach themselves to those originally precipitated, and an increase in density is the result. It must always be remembered, however, that no plan of increasing the opacity of a picture is of value when it has insufficient detail, and these processes obviously cannot *add* details of objects where none originally existed. All that can be done is to increase the opacity of what already is there, and thus it happens that photographers are so frequently disappointed in their attempts to convert positives into negatives; the requisite amount of detail being wanting, the result can only be a "soot-and-whitewash" negative.]

HIGHLY-GLAZED ALBUMENISED PAPER.—HOW TO MOUNT A PICTURE.

Wolverhampton, Sept. 16*th*, 1858.

Dear Sir,—Will you kindly oblige me with a few good hints on salting and albumenising paper, viz., the right sample of paper, with *quantity* and *description* of *chloride* best suited *to obtain violet tints?* I also desire a rather highly-glazed surface, which I have not yet been able to get by following the instructions laid down in Hardwich's formula. The glaze is only slightly perceptible even with a very small quantity of water to the albumen. What would be the result of floating twice, allowing the sheet to dry in the interval? I fix and tone in one bath of hypo. and gold.

Can you explain how it is, that when I come to mount my proof the gum sinks into the paper and completely spoils it? Can it be from too much washing, or is the fault in the paper?

Albumen.

[To obtain a highly-glazed albumenised surface on positive paper, it is necessary to use a *thin* sample of

paper (we have found some of Marion's make excellent), and also not to have *any* water in the albumen. Either chloride of sodium or chloride of ammonium may be used (for further directions to obtain dark prints, see answer to "Amateur"). If the picture be still not glossy enough, we should think that it might be re-albumenised with advantage, either before making sensitive, or after the picture is finished; in this latter case, however, it must subsequently be floated on weak alcohol and water (one part spirit to four of water), in order to coagulate the albumen.

The reason why the gum sinks through the proof in mounting is, that the size is removed from the paper during the washings. It can be resized by soaking in a hot solution of gelatine (about 40 grains to the ounce), and dried, if it be desired to use gum; but we should recommend the employment of starch paste, such as is employed for domestic purposes. This is by far the best cement for mounting photographs we have met with, and it has the further advantage of not requiring the picture to be sized, but it can be used at once. Apply it with a brush, and avoid, as much as possible, the presence of small gelatinous lumps of starch on the back of the picture when it is laid on the mounting card.]

IMPERFECTIONS IN TWIN STEREOSCOPIC NEGATIVES.

September 14, 1858.

SIR,—I use a stereoscopic camera with a double lens, but I find that very often I get one picture defective, whilst the other is clear and good, although I focus carefully, and attend especially to the light. Can you or any of your readers inform me whether this defect is often met with when two lenses are used, and whether I can remedy it?

I am, sir, yours obediently,

M. D.

[We have never met with defects of this description which were not clearly attributable to some faulty manipulation or similar cause. Care must be taken to make the developing solution run evenly over all parts of the plate, and it should be poured on and off in rapid succession towards the commencement, in order to mix it thoroughly with the nitrate of silver which it finds on the surface; otherwise, one half may be in reality brought out with a far more energetic developing solution than the rest of the plate. Another possible cause of dissimilarity between the two halves might be in the lenses, for if not made expressly to mark with each other, their focus might be different, or one might require longer time than the other, owing to a slight yellow tint in the glass. Lenses to be used in a twin camera should always be made and tested for this special purpose.

We will see if your suggestion can be adopted. When you say an "apparatus for micro-photography," do you mean an arrangement for obtaining enlarged or reduced photographs of bodies?]

GLYCYRRHIZINE IN THE COLLODION OR BATH.

15th September, 1858.

MR. EDITOR,—Will you be good enough in your next journal to say if glycyrrhizine is still used for increasing the sensitiveness and intensity of negatives (I suppose it is preferable in the bath than in the collodion), or if not now used, what are the objections to it?

Yours most truly,

G. B.

[Glycyrrhizine is still used by some photographers, although not to the same extent as formerly. It is generally added to the collodion. If added *rashly* by a person inexperienced in its properties, it has great tendency to produce negatives of excessive density and hardness, and we believe that that is the general complaint about it. Some kinds of collodion also give sufficiently dense pictures without it, and those kinds which do not require it at first, frequently acquire density in keeping; and thus, even with its greatest admirers, glycyrrhizine is only of occasional assistance; but in some cases we must admit that it is of great service, and might be employed with advantage more frequently, if photographers would take the pains to study and understand its action.

For our own part we prefer it in the bath, and a reference to part of the article on ACCELERATING AGENTS, which will appear in our next week's *Dictionary*, will give some useful information.

ANSWERS TO MINOR QUERIES.

WHITE POSITIVES ON GLASS.—*Excelsior.*—*C. E.*—

Rectified ether, sp. gr. ·720	... ...	5 drachms
Alcohol sp. gr. ·825	... ...	3 ,,
Pyroxyline	... ...	5 grains.
Bromide of cadmium	... ...	2 ,,
Chloride of cadmium	... ...	1 ,,
Iodide of potassium	... ...	2 ,,

The above formula, in addition to the information given in No. 1, p. 12, will enable you to take good positives.

SPOTS ON COLLODION POSITIVES.—*J. W. C.* sends a positive collodion portrait, which, on viewing by transmitted light, appears covered with a multitude of very small opaque spots. We have met with similar annoying visitors in our own practice. Frequently they are caused by the collodion having been used too soon after mixing; the addition of the alcoholic solution of iodide of potassium to the ether sometimes precipitates a little of the iodide of potassium in the form of a fine white powder, and if the collodion be used before that has entirely settled, spots are sure to make their appearance on the film. The remedy is obvious; either employ a weaker solution of iodide of potassium, or iodise with a cadmium or ammonium salt. A similar effect is sometimes produced in a curious state of the bath:—the pictures are in other respects as good as could be desired, but, on examining either the interior of the sides of the bath, the dipper, or the surface of the collodion plate as it comes from the bath, thousands of minute hair-like crystals may be seen. We have hitherto entirely failed in finding a remedy, except by the use of fresh materials; we suspect that the crystals are either *nitrite* of silver, caused by the nitrate having been fused at too high a temperature, or *oxalate* of silver, arising from a minute quantity of oxalic acid being introduced into the collodion with the pyroxyline; this acid being frequently produced, even in rather large quantities, if the temperature of the acids be too high during the preparation of the pyroxyline.

REMOVING THE BLACK VARNISH FROM GLASS POSITIVES.—*Photographer* asks how to remove the black varnish from the back of a glass positive, as he wishes to use it as a negative, and take a paper copy from it. The positive must be laid face downwards in a dish, and then turpentine must be covered over it; when the varnish is partially softened and dissolved, fresh turpentine must be added, and so on until all the black varnish is removed. It will be a tedious job, as no friction must be used, and the greatest care will be necessary, or the film will be loosened, and the picture be destroyed. We are here supposing that the black varnish employed is the ordinary one soluble in turpentine; if it be insoluble, however, other solvents, such as alcohol or benzol, must be tried. We give the above information as desired; but at the same time do not think that it will answer the purpose our correspondent wants it for. The appearance of a good positive when looked through is so faint, and the density of even the highest lights is so inconsiderable, that we doubt if it could be used as a negative from which to print anything like a satisfactory picture.

Transparent Spots in Collodion Positives.—*One among the Many* complains of a number of transparent spots, about the size of a small pin's head, appearing in the whites of positive pictures about a week after they are finished, the same not being varnished. The most likely cause for such an occurrence would be insufficient washing after fixing in hypo. or cyanide; the former especially would be apt to form such marks, and destroy the picture.

Ammonia in the Bath.—*In a Fix* has been neutralising the acid in his bath with ammonia; the red litmus paper changes colour a little, so does the blue. When a picture is taken the plate turns black all over on developing, and gives no trace of the subject. Our correspondent has evidently mistaken the alteration in colour which blue litmus paper assumes when *wetted*, for an indication of slight acid reaction. The bath, in reality, is alkaline, and, to correct it, a trace of either acetic or nitric acid must be used. Ammonia should not have been used in the first instance. Carbonate of soda is the best alkali to add to a too acid bath.

Film over Positive Pictures.—*Nil Desperandum* has taken several pictures on enammelled iron tablets, which, when dried, appeared coated with a light blue haze over the before perfect picture, rendering it indistinct. When immersed in water the film disappears, and the picture looks clear again. We do not know the cause of the phenomenon, except that we think it depends in a great measure on the state of the pyroxyline in the collodion. It may be remedied by holding before a fire until the tablet is too hot to touch; the haze then disappears, and leaves the picture perfect. Varnishing afterwards is an improvement, although not absolutely necessary.

No Eyes!—*Focus* has built a new glass room, and has had some palings near his dark room tarred, and since that occurrence every picture has *no eyes*. Do we think the smell of the tar extracts any properties from the bath, or interferes with the development? We think that the smell of tar, unless so strong as to be absolutely unbearable, would be of no effect in the process. The most likely reason for such a physiological phenomenon is, that in removing to a new glassroom proper attention has not been paid to the direction whence the light falls, which, entering the lens, produces a misty appearance. Lay a board the width of the camera along the top of the camera, projecting over the lens as far as possible without cutting off any of the field, and over this throw a piece of black cloth; this will doubtless prove an antidote to this ophthalmic effect.

Vignette Positives on Glass.—*Chemicus* asks how the peculiar halo or vignette appearance is given to positives. A very pretty vignette effect may be produced in the following manner:—Cut out of a large piece of black card a hole of the desired *shape* for the vignette, and a trifle larger in diameter than the full aperture of the lens. Place this on a stand or foot, so that it is exactly the same height as the lens; then, having arranged the sitter and focussed properly, place the *hole* at such distance in front of the lens, that on looking at the ground glass the picture presents the required vignette appearance, remembering, that the nearer the card is to the sitter, the larger will be the space in the picture contained in the vignette. If it be desired that the vignette picture should vanish in a white halo, the card should be *white* and well illuminated; whilst, if the picture be required to vanish into a black ground, the card must be black, and the greatest care should be taken to keep all light away from it.

Reimmersion of the Plate before Developing.—*F. S. L.* asks whether it is injurious to dip the plate into the bath after exposure in the camera, as he finds with large plates it helps the developing solution to flow more evenly. With *some* collodions a reimmersion in this way would tend to give a foggy picture, but we have not usually found this to be the case, and decidedly are in favour of using a sample of collodion which will admit of such a proceeding. Reimmersion is a very great assistance in many respects, as it not only helps in the more even flow of the developing solution, but when the exposure has been protracted for ten minutes or more, it would be nearly impossible otherwise to cover the plate at once with the developer, and it also removes any little particles of dust which may have settled on the surface, which would form centres of irregular action (or solid nuclei of long tailed comets, as the papers would say). Redipping also thoroughly moistens the film all over, and makes the upper part, which has nearly or quite dried, equal in its development with the lower, moist part.

Granular Appearance in Albumenised Paper Positives.—*C. B.* asks how to prevent paper positives (both plain, salted, and albumenised) from becoming speckled and yellow, and incloses two specimens. A similar effect is produced when the positive is removed too soon from the hypo. bath, when removed too soon from the washing water after fixing, or when the fixing bath is too weak, or has been in use too long. No remedy is known. It may be prevented, however, in the following way:—employ a new (or nearly so) fixing bath of a not less strength than 2 ounces to the pint, wash the prints in water before fixing, and then keep them in the hypo. for at least a quarter of an hour. When fixed, wash in a large dish of cold water for forty-eight hours, changing the water every eight hours, then give them one or two short washes in hot water, and dry. If required to be coloured, it should be done before fixing. See second answer to *J. B.*

Varnish for Negatives.—*Veritas.*—We use a colourless spirit varnish imported from France, which is applied with heat; but we confess ignorance as to its composition, and should feel obliged if some reader cleverer than ourselves would enlighten us. See answer to "Bungler," vol. i., p. 24.

Leather for Collodion Positives.—*Amateur* asks what kind of leather is used for taking portraits on. The kind known under the name of "Patent Calf" is the best for this purpose; it can be obtained at any leather warehouse. 2. Brunswick black. 3. Whichever you like; the terms are used indiscriminately.

TO CORRESPONDENTS.

W. H. H.—Collodion will lose its fluidity when kept, owing to the evaporation of ether. Cadmium collodion also becomes glutinous when kept even closely stoppered. The reason is supposed to be a reaction of the metallic salt on the pyroxyline, but very little is known about it. The addition of iodide of potassium to the iodising compound will prevent such an occurrence.

R. B.—Most of the elementary works on photography would contain the information you desire. Our catechism, we should think, would be your best guide.

An Amateur.—1. Citrate of the protoxide of iron. 2. Either equal parts, or a saturated solution. 3. The authors stated so. 4. Floating will do. 5. Amber varnish would not do so well as a spirit varnish.

J. B.—The *chemical* part of the process for taking pictures by gaslight is the same as for daylight, but, of course, the *mechanical* arrangements must be different. 2. See answer to S. P. Q. R. 3. Stereoscopic pictures may easily be taken with a common camera. The two positions for the camera must first be decided upon, and then a picture taken from each position. These two will then be stereoscopic if printed from and mounted properly. The objection to this mode of working is, that the object is liable to move in the interval of time elapsing between the two exposures.

Enquirer.—F. C. S. means Fellow of the Chemical Society.

W. D.—Iodide of ammonium.

T. T.—The desired information will appear very shortly in the "Catechism." In the meantime see answer to E. B. G., vol. i., p. 23. Yes. Will our correspondent kindly favour us with the names of one or two persons in his town, who would be likely to undertake the agency of the "News?"

M. H.—We do not think you can do any good with either collodion; *try* how they work after mixing them together, and allowing them to stand for twenty-four hours.

S. K. W.—See answer to "Nil Desperandum."

G. D. S.—A. S. L.—K. V.—Anthony.—See answer to S. P. Q. R.

E. C.—G.—Subscriber.—F. C.—An Amateur.—Cornish.—F. L. B.—Our correspondents will see that it is out of our power to save them the trouble which is indispensable in mastering the principles of any science.

Received:—Subscriber—J. H.—W. D.—W. M.—J. W.—J. P. G. J. W.—J. B. P.—J. C. S.—J. W. N.—G. M. F.—J. W.—Earnest—T. S.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, Belle Sauvage Yard. Private letters for the Editor, addressed to the office, should, in all cases, be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 4.—*October* 1, 1858.

APPROACHING PHOTOGRAPHIC EXHIBITIONS.

In January next an Exhibition of the Photographic Society will be held in the Old Water Colour Society's Rooms, Pall Mall East, which we have no doubt will be highly successful, as that is a locality which is easily accessible, not only to photographers, but also to those who take an interest in photographic progress. And again, the facilities for hanging, and the good arrangement of light will conduce materially to the success of the intended exhibition. The Council of the Society have passed a resolution which has not only astonished us, but many others. We have received several communications on the subject, but, as our space is very valuable, we do not feel justified in giving anything more than a general notification of the fact, because we are sure that if the Council will only reconsider the subject, they will see that there has been a degree of precipitancy in passing the resolution which will not stand the test of deliberation.

The resolution is to the following effect :—"That no photographs will be admitted that have been exposed in shop windows, or otherwise publicly exhibited in this country." As we have said, we have received remonstrances on the subject, and we perceive that dissatisfaction is expressed in other quarters. The resolution can excite but one feeling, that of disapproval. It seems to us to be a most effective attempt to defeat the object of exhibitions, because it will easily be seen that to exclude a photograph from an exhibition, simply because it has been exhibited in the shop windows, is a most arbitrary regulation, since many of our leading photographers have their respective publishers, and it is not likely that a publisher would so far forget his own interest as to withhold the publication of a photograph until it had been exhibited at the Society's exhibition. Take an instance.—There have been a series of photographs of Cherbourg recently published, giving views not only of the fortifications, but also of the combined fleets of England and France. Now it is very certain that to prohibit the exhibition of these would be to lose the sale of them, because the interest attaching to them, as far as regards the public, is transitory ; but some of them, as photographs, would be interesting to the visitor of a photographic exhibition. It is clear that such a resolution cannot but have a bad influence upon exhibitors, more especially upon those photographers who publish annually. If the resolution means anything, it means that it will be strictly adhered to ; but, to put all doubt upon the matter out of the question, we have it upon official authority, that "this resolution will of course be strictly carried out by those who receive the photographic works and arrange them on the walls." Yet, on the same authority, we are informed that the "resolution is not intended to exclude the works of our photographic brethren exhibited at the exhibition in Edinburgh." Now, unless political or geographical changes have taken place of which we are not cognizant, we believe that our brethren on the north side of the Tweed belong to "this country." Altogether there is a vagueness in the resolution which will preclude the possibility of carrying it out. How are the hanging committee, which is generally composed of metropolitan members of the Society, to know what has been exhibited in Dublin, Leeds, York, Edinburgh, Glasgow. And again, are there not many who annually make the Photographic Society's Exhibition the object of a journey to London? and it cannot be expected that they can have seen what has been exhibited in the shops of London any more than the Londoner can have seen what has been exhibited in provincial shop windows. There is always, in connection with photographic views, a local interest which requires that they should be exhibited in the localities in which they are taken, in order to repay the trouble and expense attendant upon their production. But how unjust to exclude them from the benefit of metropolitan exhibition. If the Council are determined to have a resolution passed to prevent that re-exhibition of pictures which has so marked the last one in Coventry Street, let them pass a resolution to the following effect :—"That no photographs will be admitted that have been exhibited at previous exhibitions."

We have been kindly informed by a correspondent that, judging from present appearances, there is every likelihood of a very good collection being formed at Edinburgh. The exhibition opens in December ; and a new feature has been introduced by the managers of the exhibition in the shape of prize medals. It is intended that they shall be of two classes. The one for the best photograph produced by a member of their own Society, the other to be given to the photographer of the best picture, he not being a member, but an exhibitor. We are of opinion that this cannot in any way benefit the cause of photography. As all our readers know, there is no need of such a stimulant to exertion. There is too much friendly rivalry in the ranks of photography to need the bait of a silver medal. We all know that every photographer endeavours to produce the best picture he can, hence the thousands upon thousands of attempts which are daily and hourly being made in order to improve upon past successes. Again, it must be a matter of considerable difficulty to decide what constitutes the best picture, seeing that photography can be applied to so many things. For instance, here are some of the difficulties which arise in our mind. Will the prize be given for the best landscape, the best portrait, or the best copy of a picture? All these branches are very important in their way, and to each ought a medal to be awarded. Some people admire nothing in photography but landscapes ; others, picture copies ; and a very large section of those in-

terested in photographic matters, portraits. So that here will be the introduction of an apple of discord, and whatever direction the wisdom of the adjudicators may take, it is certain that a great number will be dissatisfied. However, we must await the result of this new experiment to see if our forebodings will be borne out by actual experience.

ON THE CALOTYPE PROCESS.

Each negative process possesses advantages which it is utterly impossible to combine, and for this reason only, men never can agree as to the *best* method of getting a negative. For architecture, and indeed almost any class of subjects except statuary, paper gives results fine enough to satisfy a very fastidious taste; and in truth, for boldness and large pictures, glass gives no better results than this. Mudd's "wax-paper" rocks, old cottages, &c., and Turner's "calotype" old oaks, &c., equal anything of the same size that we meet with, whether glass or paper. Again, for a fortnight's trip, dry plates are perhaps the most convenient, having the advantages of great certainty; no need of development until our journey is finished; and good for any subject, statuary, water, or landscape;—but, for a six weeks' trip this process would be very inconvenient on account of the weight of such a quantity of plates (especially if large ones), the uncertainty of their keeping so long, and the trouble of packing so many. Wet collodion, with its tents, &c., makes quite a load for a horse, and in some places it would be impossible to transport it. Paper alone is left to a man in these cases, and his choice lies betwixt wax-paper and calotype. Perhaps for boldness and sharpness the latter is the better of the two, but in point of cheapness it is infinitely preferable, and certainly it is less difficult (*i. e.*, as far as I can judge, and I know both) to a beginner. One difficulty alone there is in it, and that is our first consideration; viz.,—

The Paper.—Of all the papers which I have worked, none give as fine results as the old "Turner's." Its even, close grain had almost the uniformity of glass, and its dense skies needed no stopping out: but after a time this make of paper grew less uniform, and became also spotted all over in the process of bringing out the picture, owing to there being small portions of iron in its texture, which unfitted it for this process. Whatman's, or Hollingsworth's as it is now called, is perfectly free from all impurities, works beautifully white and clean, and, indeed, would be the perfection of calotype paper but for the one defect—the want of density in the blacks; this fault cannot be remedied by any care, and we must either rest content with a *dirty* sky, or fill it out, which is sometimes impossible. The French paper is utterly useless for this purpose, and no amateur need make the experiment and waste his time. From what I have heard, I should almost advise a beginner to work a few sheets of Turner's, procured at any trustworthy dealer's. When the paper is cut to the size of the dark slide, the second thing is

To Iodise.—Take any quantity of distilled water, and to each ounce add 15 grains of nitrate of silver. In another vessel put the same quantity of distilled water, adding 15 grains of iodide of potassium; dissolve, then pour the solutions together, and a yellow precipitate of iodide of silver will be formed, and will sink to the bottom; pour off the liquid, but be careful that none of the precipitate is lost; add 3 or 4 ounces of rain or distilled water; stir with glass rod; let it remain to settle; pour off, and repeat this washing. The reason of this washing may appear intricate to the beginner, but the separation of the iodine from the iodide of potassium, which leaves the latter to go to the silver, and form iodide of silver, causes the nitric acid to be free to unite with the potassium, and to form nitrate of potassium, which latter, being *soluble* in water, whilst the iodide of silver is *insoluble*, is washed away, or nearly so, in these changes of water. When it is well washed, pour off, carefully as before, as much water as possible, and then, to the precipitate from the above-mentioned 15 grain solutions, add 140 grains iodide of potassium, and fill up with distilled water to make one ounce; probably these 140 grains will not cause all the *precipitate* to dissolve; in which case, add a few grains at a time until the whole of the iodide of silver is dissolved, and the solution becomes quite clear. This is called the double solution of iodide of potassium and silver, and must be applied to the papers cut to the size of the dark frame. To apply it some use the glass dish and float, others the glass rod, but I think the brush made for photographic purposes is more convenient and less troublesome. Lay the paper on a piece or two of blotting paper, and brush the solution well over it, first *along* and then *across* the sheet, and hang it up to get dry, or nearly so. A man may readily brush over thirty or more in an hour; and as (when well washed) they will keep any length of time, or, to speak more truly, improve with keeping, one need not fear doing too many. When the sheets are dry, or approaching dryness, place them in some large vessel of water to wash out the superfluous iodide of potassium which was used to dissolve the iodide of silver in the first preparation. To do this effectually the sheets must be moved about, and the water changed twice or thrice, until each piece is of a deep primrose colour; some papers require three hours only, none should be washed less, some four or five, and I have met with one paper which had to be washed for six or seven. If in the finished negative there are white patches, it arises either from the potassa salt not being washed out, or from the liquid not being spread over the whole surface of the paper. I always deem the well washing of the negative sheets one of the most necessary points in this process. I am even careful to wash the yellow sheets in clean water before hanging them up to dry. In this stage light does no injury, however strong; indeed, it does them good to place them in strong sunshine.

(*To be continued.*)

NOTES FOR ALPINE PHOTOGRAPHERS.

Lausanne, *Switzerland*, *Sept.* 16.

Dear Sir,—Perhaps a short gossipping account of a pedestrian tour lately made by myself and a friend to the valley of Zermatt and Aosta may not be uninteresting to some of your readers. Being amateur photographers, we determined to try how far we could

prosecute our favourite art on such an excursion without bothering ourselves with too much "impedimenta." Photography was only a secondary affair; a fact necessary to be borne in mind. But we kept our photographic eye open throughout our tour, and perhaps a note or two as to what we saw worthy of the photographer's attention may prove useful to some of our brethren of the camera intending a similar excursion next season.

Although I had had very little practice in any of the dry or preservative processes, and that practice had not particularly prepossessed me in favour of any of them, I determined to try the oxymel process of Mr. Lewellyn, which seemed to me to offer the greatest facility in preparation, and the greatest probabilities of success in the result. This determination I came to in order to avoid the disagreeable necessity of developing my negatives "*en route*" at night in a strange place, and after a hard day's walk, when sleep is absolutely necessary. Now the plates (stereoscopic) so prepared were all successful as far as exposure, development, and intensity were concerned; *but* (how often has the poor amateur thus to qualify his most successful results!) a mishap befel them, which rendered all more or less worthless for printing purposes. Not possessing a box for holding glass plates, I borrowed one from a friend. This box was made of tin, with internal grooves as usual, but, unfortunately, the interior is blackened with a very coarse lampblack, mixed with some vehicle, and smells like the strongest soot from an ordinary coal fire. Although I took the precaution of placing some *papier Joseph* on the top of the plates to prevent their shaking about, I found the plates, when I took them out in order to develop them, covered over with little black atoms from the lampblack, which it was impossible to get rid of by washing, and which bespangled the developed plates with spots, stars, and comets, according to the shape and size of the particles deposited. I inclose a print, a bit of the Görner glacier, which runs into the valley of Zermatt. Here you can stand on the green grass and touch the glacier with your hand at the same time. The negative was developed some ten or twelve days after exposure. Had all the plates been as free from spots as that, I should have esteemed them worth preserving as mementoes of places I may not have an opportunity of revisiting. My misfortune, or, as some may think it, my want of foresight, may prove a useful caution to beginners not to employ similarly blackened boxes for holding their oxymel plates.

With the print of the glacier I send you another taken by me last week on a plate prepared according to the novel formula about which I wrote to you. The plate had been sensitised a week; exposure, 3½ minutes. If you think the result tolerable, I shall be happy to give you more particulars concerning the process.

In addition to these oxymel plates, I took with me a few plates prepared most carefully according to Dr. H. Norris's plan. I presume my collodion was not adapted for the process, for I got no good results. The same collodion which gave good negatives with four or five minutes' exposure, when employing oxymel, afforded but a faint positive when employing Norris's formula; and I am convinced, from a number of experiments carefully made since my return home, that the oxymel or syrup processes are the easiest, and by far the most certain of all the preservative processes. To do anything at all with gelatine, it is necessary to have a sample of pyroxyline made by a very experienced hand, and even then the preparation of the plates is much more difficult and tedious, the exposure very long, and the results, in my opinion, no better. In the last number of one of your contemporaries there is a paper by Mr. Lewellyn on a modified oxymel process, which will be found most excellent, although it is diametrically opposed in theory and practice to the opinions of Dr. H. Norris and others. Mr. Lewellyn would add to our many obligations to him if he would tell us exactly what formula for the silver bath he uses, and whether he manufactures his own collodion, or whether he employs, as I have been told he does, that made by Ponting. While the English photographic authorities inculcate the necessity of having a bath slightly acid, the French and other continental authorities, Davanne, Monkhoven, &c., as strongly insist upon a neutral one, nay, even one with a slightly alkaline reaction. I have been trying lately, side by side, a neutral and an acid one, both for wet and dry collodion. The films sensitised in either bath are equally free from fog, but the neutral bath gives far greater rapidity and density of image. I have employed distilled water and rain-water for the bath, without any perceptible difference in the results. But this is a long digression from our road to Zermatt. S.

(*To be continued.*)

[Our correspondent has forwarded us two very beautiful pictures; they each speak volumes for the excellence of the processes by which they were taken. The one of the glacier has a few "comets" in one corner; but they are evidently owing to the unphilosophical manner in which the maker of the tin box had tried to make it further opaque. Besides, comets at this present season are objects of great interest. We shall be glad to receive a full account of the novel mode by which the second named plate was prepared, as also the continuation of the present article, which we are sure will be read with great interest.]

New Discoveries.

On Copies of Designs produced by the Adherence of the Vapours of Phosphorus, Sulphur, Chlorine, and Sulphuretted Hydrogen. *By M. A. B.*

One of the professors of the Technological University of Florence, M.A.B., made in July last, and published in the last number of the *Nuovo Cimento*, some interesting experiments on the mode of reproducing engravings and designs by means of vapours of different substances, described by M. Nièpce de St. Victor in his paper of March last. We give a hasty analysis of this interesting communication.

A design exposed for a certain time to the vapours of phosphorus reproduces itself when brought in contact with paper prepared with chloride of silver. The vapours condensed upon the outlines of the design, and not on the ground, decompose the salt of silver, and produce faint lines which represent the blacks of the design. To obtain a good reproduction, it is necessary that the design should remain exposed to the action of the phosphorus about three-quarters of an hour, and remain in contact with the sensitive paper for twenty minutes. The chloride of silver not decomposed is dissolved by placing the paper on the hyposulphite of soda, and afterwards washing it in pure water. The proof thus

obtained is faithful, but it is not an artistic proof, and the original design is always destroyed or spotted.

A design can be reproduced by exposing it for some moments to the vapour of iodine, and pressing it against a paper sized with starch, and glazed like ordinary letter paper. A single exposure to the vapour of iodine may give several copies, but they become effaced in time, and the original is always a little damaged.

One may operate in the same manner with the vapours of sulphur, sulphuretted hydrogen, and chlorine. In the case of the two first named vapours, the paper is prepared with the chloride of silver. In the case of chlorine, a sheet of paper sized with starch, and soaked in a solution of iodide of potassium, on coming in contact with the chlorine, has its iodide decomposed; the liberated iodine colours the starch a sky-blue, which designs the blacks of the engraving.

What are the essential elements of the reproduction? What are the agents which modify them? It was quite natural to think at first of the chemical action, and to assure ourselves if it really works. In fact, the condensation of the vapours is always greater where there is the greatest affinity between the vapours and the substance with which the outlines of the design are found. Among the numerous experiments which demonstrate this truth, it will suffice to cite the following facts:—In exposing to the phosphorus the designs made with different substances, the greatest intensity of action has always been obtained when the substance employed was oily or fatty matters in which, as is known, phosphorus dissolves. Thus engravings printed in printer's ink reproduce themselves much more quickly when the ink is fresh than when it is dry or old, and very much more quickly than if the design had been traced with common ink. Figures traced upon paper with alcohol which were allowed to dry until they became invisible, reproduced themselves perfectly upon starched paper after exposure to the vapours of iodine. The reproduction is much feebler when water is substituted for the alcohol; it is well-known, indeed, that iodine, which is very soluble in alcohol, is almost insoluble in water.

Chemical action therefore intervenes in the phenomenon, but it is not the essential or unique cause. The greater or less degree of polish of the surface exposed to the vapours, for example, has a much greater influence. Two papers were exposed at the same time, the one glazed, the other not, and a condensation was produced which was evidently much greater upon the second than upon the first. A fretted paper, imitating the skin, similar to that used by bookbinders, reproduced the asperities in more sombre outlines than the ground. The borders of the paper exposed to any vapours whatever, especially if they are chafed, reproduce themselves in much deeper tints than the rest, and thus show that they are more charged with vapours. These last facts lead to the supposition that any mechanical action exercised on the surface of the paper would determine an unequal condensation of the vapours to which it might be exposed. Now, experience has proved that a design made upon paper by rubbing it so lightly with a point that the outlines were not visible to the eye, showed itself distinctly as soon as the paper was exposed to the vapours of iodine. . . . To render the appearance of the design much more distinct, it is advisable to operate upon paper sized with starch and glazed, to expose it to the vapours of iodine, and then to plunge it in water; the design then shows itself of a beautiful azure blue upon a much clearer ground.

By pressing upon a sheet of paper a seal or a plate of engraved copper, and afterwards exposing the paper to the vapour of iodine, the outlines are seen to appear, even when the paper is washed after the action of the point or of the seal pressed against it, and dried before exposure to the vapours of iodine. A plate of well-polished glass presents the same phenomenon, but in a much feebler degree, and if we operate by pressure, this pressure must be much stronger.

All these experiments and many others lead to the conclusion that the cause of the fact announced by M. Niepce de St. Victor, is the mechanical alteration that the sheet of paper undergoes in certain points, and that this principal cause is in many cases modified by the chemical action which operates between the vapours and the substance of which the design is composed. It will be true, in general, that each time that a surface has undergone a mechanical action of any kind in some of its parts, it acquires on these parts the property of condensing all the vapours that fall upon it, and combining with them in a special manner. We have recourse in this way to a rather similar theory to that by which the images of Möser have been explained, which were probably traced by a condensed vapour, after a mechanical or physical action had modified upon some points the molecular condition of the surface. The images obtained by M. Karsten upon plates of glass or metal by means of electrical discharges, and which became visible by exposure to any vapour whatever, prove that electricity is apt to produce the molecular alteration which afterwards determines the condensation of the vapours, unless one prefers to admit that the electricity alters the veil of vapour of water which naturally covers the surface of the body acted upon by it.

Are light and heat able to produce analogous effects? M. A. B. has made some experiments with a view to answer these questions, but they have not led to any conclusive result; the only fact very clearly observed is the following: a white paper placed in the focus of a lens exposed to the solar rays, and left to itself for a certain time afterwards to re-establish the equilibrium of the temperature, and then exposed to the vapours of the iodine, has presented a white spot at the point which corresponded to the focus; which proves that at this point the condensation of the vapour was less than elsewhere. Others will find perhaps better means of evidencing the action of light and heat.

In conclusion, everything induces us to believe that the different phenomena like those pointed out by MM. Niepce, Möser, Karsten, have their common origin in the molecular alteration produced, on certain points of the surface of a body, by a change of position that some molecules have undergone; this displacement, this new state of equilibrium, may afterwards become in its time the cause of the unequal condensations of vapour. The laws which govern these different attractive actions remain hidden like all the laws of molecular mechanics.—*Cosmos.*

Critical Notices.

THE PHOTOGRAPHIC EXHIBITION AT THE CRYSTAL PALACE.

SECOND NOTICE.

There is here an almost utter absence of compositive photography, except in the productions of Mr. Robinson, of Leamington, which almost reconcile us to the principle which we believe scarcely applicable to photography. But we will not now enter into the question, as it would be foreign to our purpose, and would require more space than we have at command, but at some future time we may take the subject up, as much on account of its applicability, its utility, and the general considerations which may be urged in favour of its use, as of what may be said against it. We have no objection to single or even double figure subjects, which can be taken in one sitting; what we most object to is the patching process. The photograph, "Fading away," is an exquisite picture of a painful subject. There is such an amount of true feeling in it, that we cannot help giving it a lengthy notice. The picture is treated in the following manner, and is an exemplification of these beautiful lines by the poet Shelley:—

"Must, then, that peerless form
Which love and admiration cannot view
Without a beating heart; those azure veins,
Which steal like streams along a field of snow
That lovely outline, which is fair
As breathing marble, perish?"

In the centre is a beautiful girl, on whose countenance is evidently written her doom; wan and wasted, she reclines on an impromptu bed, behind which stands her sister, sorrowfully musing, and immediately facing the sister is the tender mother, who gazes on the wasted form of her child with great maternal anxiety. On her knee is the Bible, which she has just been reading, and at the window stands the lover of the sick girl.—He with melancholy pensiveness is watching, from the window, the setting sun, which, to his eye, is evidently a type of her, who, for him, is no less surely "fading away." It seems almost incredible that such a difficult subject could be so beautifully treated by a merely mechanical process. But the great success which attends Mr. Robinson's efforts is owing to his being so ably seconded by a young lady, who, to say the least of it, is thoroughly able to appreciate and enter into the feeling of the poetry or sentiment which it is his object to elucidate. Be the character what it may, she thoroughly understands her part, and, with an art peculiarly her own, she makes the picture something extraordinary. In this instance we are utterly unable to understand how she can enter into the subject in a manner so *con amore*, because, of all characters that of a sick person is the most difficult to delineate. Even on the stage, assisted by all the trickery of the profession, a correct representation of the character is a triumph of artistic skill; but when we come to photography, which would expose anything like extraneous superfluousness, it is really astonishing. That there are defects in the picture we do not deny; there are many; but these, we apprehend, are not attributable to any fault of the composer, but are inseparable from the means by which the picture is obtained. For the size of the picture there is decidedly too much drapery on either side of the windows, while the arrangement of one or two things is slightly out of drawing. But probably these are things which may be obviated in future attempts. Then, again, though the secondary figures which are necessary to form the picture are good, and are equal to the average run of good photographic models, yet the difference between *the* model—the gem of models—and the others, is painfully perceptible. For instance, the figure which represents the sister fails to give that true expression which is requisite for the part assigned her. She enters but partially into the feeling of the subject, and the expression is consequently forced; hence, instead of a countenance portraying melancholy feelings, we have one of blank musing, not quite in keeping with the rest of the picture; while the lady who plays the part of mother, does it so well that one cannot help being struck with the truly maternal expression of her face. There is all that solicitude which motherly instincts prompt—that loving gaze which the mother bestows on her favourite sick one. The male figure is well placed, and although the beholder only sees his back, there is in the attitude a pensiveness which at once tells its own story. We wish Mr. Robinson every success in that peculiar and difficult branch of the art; and if it is to be recognised as the artistic department of photography, let us at least have men who can do the proper thing, and in the proper manner. This picture gives a good idea of Mr. Robinson's capabilities, and we must really warn Mr. O. G. Rejlander to look to his laurels. There are one or two other pictures in which we again have the favourite model. The first is a small picture entitled "I know." There is a girl walking along in a thoughtful mood, dressed with scrupulous care in the country fashion—in fact, the costume partakes of the antique, and it would require but little stretch of the fancy, to imagine that she was the "Evangeline" of Longfellow—by her side is a smiling, wicked-looking little lass, who evidently is in the secret as to the cause of all this melancholia, undoubtedly the result of a love affair, and the picture represents the time when the mischievous little teaze is rallying her friend, and is with a chuckle uttering the words "I know." This is the only attempt we have seen at humour on the part of Mr. Robinson, and he has the advantage over other compositive photographers, that he carefully excludes what is vulgar, and knows where to stop. There is also another picture in which there is a girl dying (our favourite being again the model), represented with such statue-like fidelity, that our admiration is divided between it and "Fading away." The drapery in this study is something marvellous; every fold is so carefully placed, that were it a copy from a marble statue, there could not be greater precision and accuracy displayed. Underneath this picture are the following lines:—

> . . . . "She never told her love;
> But let concealment, like a worm i' the bud,
> Feed on her damask cheek."

Admirably does the face of the model portray the feeling of secret love. There is such a gentle loveableness, and, at the same time, such an unmurmuring resignation, that were this figure painted on canvas or sculptured in marble, great praise would be due to the artist who could so idealise the poet's description. How much greater, then, is the praise due to the artist who has borrowed the expression from a living model! There are some smaller but less pretending pictures here by Mr. Robinson, evidently impersonations of "Little Red Riding Hood," whose adventures with the ravenous wolf have been more extensively read than many more pretentious volumes. In these pictures there is evidence of the same care in grouping which so distinguishes Mr. Robinson's efforts; but the model is far inferior to the one we have already alluded to. Probably we find a greater difference owing to the contrast. But if we recollect rightly, the nursery favourite had scarcely such a smirking face as that of any of the figures in these pictures. In this lies the chief fault, that the model has been unable fully to appreciate the task which she has to perform; but in the hands of such a skilful trainer as Mr. Robinson we may hope to see greater results. Altogether, the "Red Riding Hood" series cannot by any means be compared with the other studies we have noticed. While we see many of Mr. Robinson's best productions here, we miss that most charming of all his poetic subjects, "Juliet," that was exhibited at South Kensington, and which we shall not soon forget. There is also one frame which was exhibited at Coventry-street Exhibition, with three studies, viz., "Vanity," "Fear," "Devotion." All these are remarkably clever, but his decided success is his study of "Fear." There is in the face such a true expression of fear, that the inscription is needless. How strikingly it contrasts with those maudlin attempts to illustrate fear, which are constantly made in the ghost pictures for the stereoscope. There is a refined delicacy in the expression which is not to be met with but at rare intervals in compositive photography. What does Mr. Robinson think of the suggestion of illustrating Longfellow's Evangeline? Here is an opportunity for him to enter upon a subject which he is fully competent to handle. There is in that poem all the simplicity and genuineness of feeling which are necessary for this class of picture.

Photographic Chemistry.

CHEMICAL NOMENCLATURE.

(Continued.)

In the next number of the "Photographic News" we propose to give a table of the symbols and equivalents of substances used in photography. Before proceeding with the subject of metals and metalloids, we shall describe, as briefly as is consistent with clearness, the nature of the composition of the different gases referred to in the preceding articles.

Oxygen is a transparent and colourless gas, the specific gravity of which is about 1·1007. Its properties will be gathered from the necessary references to it in future articles.

Hydrogen, like oxygen, is a permanently elastic gas, the specific gravity of which is sixteen times less than oxygen. It combines with the latter gas in equal proportions to form water.

Nitrogen, or, as it is sometimes termed, azote, is a colourless and inodorous gas, of a specific gravity a trifle less than oxygen, viz., 0·9748. This gas, in the proportion of 80 parts to 20 of oxygen, forms atmospheric air.

Nitrous acid is formed by condensing the vapour arising from the mixture of oxygen and deutoxide of azote. If 100 measures of the former is mixed with 200 of the latter, it immediately condenses to 100, and the result is a deep red vapour, termed nitrous acid vapour, which, when cool enough, is condensed to the acid above mentioned. The proportions in which nitrogen and oxygen combine to form

Protoxide, consists of ...	100	azote, and	50	oxygen.
Deutoxide	100	"	100	"
Hyponitrous acid	100	"	150	"
Nitrous acid...	100	"	200	"
Nitric Acid	100	"	250	"

There are seven hydrogenated acids, or hydracids, all of which are formed by the union of 1 equivalent of hydrogen to 1 of chlorine, bromine, iodine, fluorine, sulphur, selenium, or tellurium. As only one acid is given by the combination of hydrogen with each of these metalloids, the symbols are thus written :—Hydrochloric acid, H Cl; hydrobromic, H Br; hydriodic, H I; hydrofloric, H F, &c.

The union of hydracids and oxacids with bases forms salts; the combinations of hydrochloric acid and nitric acid with potash and lime give salts of those substances. In the formation of hydracid salts one may as reasonably attribute it to a simple union with the base, as to the decomposition of the hydracid, the radical of which, in uniting with the metal of the base, abandons the hydrogen, which, with the oxygen of this same base, forms water. When the reaction takes place, in the midst of a liquid, and the salt remains dissolved, it cannot be known exactly what passes. For example, hydrochloric acid (H Cl) uniting with potash (K O), may as well represent hydrochlorate of potash (H Cl, K O), as the chloride of potassium (K Cl) and water (H O); but if the salt which is formed be insoluble, the decomposition of the acid and the base is rendered visible. It is thus that hydrochloric acid, united to the oxide of silver, gives insoluble chloride of silver and water, which may be thus stated: H Cl + Ag O = Ag Cl + H O, hydrochloric acid + oxide of silver = chloride of silver + water.

In the salts formed by an oxacid it is generally admitted that the acids unite with the base to form the salt; in this case there is no decomposition of the acid or the base; thus: $H\,O.N\,O_5 + Ag\;O = Ag\;O.N\;O_5 + H\;O$, nitric acid + oxide of silver = nitrate of oxide of silver + water.

The equivalent of water which was united to the acid is alone separated. These two bodies, resulting from the action of an hydracid or an oxacid upon a metallic oxide, are both equally salts.

There is a compound body which, in its general effects, has all the characteristics of a simple body; this body is cyanogen, represented by the cymbol Cy, as if it were indeed a simple body, though it is in truth composed of 2 equivalents of carbon to 1 of nitrogen, $C_2\,N$. Cyanogen may be produced by heating charcoal and ammonia in contact. Combined with potassium, it forms a compound very frequently employed in photographic operations, viz., cyanide of potassium, K Cy. It is to the presence of this gas that Prussian blue owes its brilliant colour, and its combination with hydrogen and other bodies produces several acids in very extensive use, among which is included that deadly poison hydrocyanic acid, commonly called prussic acid.

Ammonia itself is a compound possessing singular properties. It is formed of a combination of 1 equivalent of nitrogen with 3 of hydrogen, and when combined with 1 equivalent of water, it, in its action, resembles a metallic oxide, and is by many chemists considered as such.

Chlorine is a greenish coloured gas, and, by its combination with metals, produces the numerous chlorides; and when combined with oxygen in the proportion of 100 parts of chlorine to 111·095 of oxygen, it produces *chloric acid;* and when combined with the same gas in other proportions, it gives protoxide, peroxide of chlorine, &c. Hydrochloric acid, or muriatic acid, is likewise formed from a combination of chlorine with hydrogen. Chlorine destroys most vegetable colours submitted to its action.

Resembling chlorine in some of its properties, and derived from a similar source, iodine, in combination with various substances, is extensively used in the practice of photography. It may be obtained by drying and powdering seaweed, and treating it with sulphuric acid; a vapour of a violet colour is given off, which, if received in a cool body, condenses on its sides in the form of scaly crystals, having a somewhat metallic lustre. These crystals are the substance termed iodine. It has the power of destroying vegetable colours, and combined with oxygen or hydrogen, forms acids. It also combines with oxygen, producing the substance termed iodic acid.

Another substance resembling the two preceding can be obtained from bittern, the residual liquor which remains after the salt has been removed from a large quantity of sea-water—this is termed bromine. The process of obtaining it from bittern is somewhat complicated. It combines either with oxygen or hydrogen, forming in the first case bromic acid, and in the latter hydrobromic acid.

(To be continued.)

Dictionary of Photography.

Accelerating Agent (*continued*).—Mr. Maxwell Lyte has described a very excellent accelerating agent—honey. The whole basis of his process consists in the great reducing power of grape sugar, when mixed with pure nitrate of silver, and applied to the sensitive plate. On account of the difficulty of procuring perfectly pure grape sugar, as the commercial article is almost always adulterated with foreign substances, it is preferable to use honey, which seems to meet all ends. It is much to be preferred that the honey should be old and candied: not the ordinary Narbonne honey, which is most frequently merely

honey adulterated with water, but good, pure honey, which has been kept for a long time, and which, by exposure to the air, has become perfectly solid, or nearly so. The plate being, first of all, prepared in the ordinary way with collodion, and the usual nitrate of silver bath, is to be withdrawn and allowed to drain. Then make a syrup composed as follows:—

Nitrate of silver	200 grains.
Distilled water	12 ounces.
Old honey	8 "
Alcohol	1 "

Mix and filter in diffused daylight, and then carry the liquid into a dark room, and filter through animal charcoal until colourless: place a lump of camphor in the latter, and let it stand for a short time, and it is ready for use. After the plate which has been removed from the nitrate of silver bath has drained for a few minutes, this syrup is to be poured over the plate, and then, after a second draining, the plate is ready to be placed in the dark frame. This method of preparation yields a film of such exquisite sensitiveness, that Mr. Lyte has succeeded in taking by its means ships sailing and waves breaking. In a warm climate a plate thus prepared will not keep its great sensitiveness for more than an hour, but, in England, instantaneous pictures may be taken after four or five hours keeping. Pyrogallic acid is to be used for developing.

Under some conditions of the nitrate of silver bath and collodion, the addition of glycyrrhizine to the former acts as a powerful accelerating agent. The best kind of collodion to be used for this purpose is a colourless cadmium one, neutral, or slightly acid to test paper, and giving a tolerably creamy film. The nitrate of silver bath is to be made in the following way:—

Fused nitrate of silver	600 grains.
Iodide of cadmium	3 "
Alcoholic solution of glycyrrhizine (strength 5 grains to the ounce)	1 drachm.
Alcohol	3 "
Glacial acetic acid...	10 minims.
Water	20 ounces.

The nitrate of silver and iodide of cadmium must each be dissolved in a small quantity of the water, and then mixed and agitated until the precipitated iodide of silver has redissolved in the nitrate of silver, then add the glycyrrhizine, acid, and alcohol, and, lastly, the remainder of the water. It should be filtered before using.

If it be wished to add the glycyrrhizine to an old nitrate of silver bath, it can be effected as follows:—add the required quantity of alcoholic solution to the bath, and, after well shaking them together, coat a glass plate thickly on both sides with collodion, plunge it in the bath, and allow it to remain there for about twenty-four hours; at the end of that time remove it; filter the bath through fine filtering-paper, and it will be fit to use.

The proper kind of developing solution to use for this purpose, is one containing less acetic acid than usual. If there be more than 10 or 15 minims to the ounce, the negative will be wanting in vigour and density, the acid having too retarding an effect on the reducing power of the pyrogallic acid. A little alcohol may be added if necessary, to make the solution flow readily over the plate.

More than extra care will be required in working with glycyrrhizine in the bath. The sensitiveness of the film is so much increased, that circumstances which would have been without effect in the ordinary process, will here give rise to stains and markings. Vertical lines in the direction of the dipper are liable to be produced, if the plate be not moved up and down several times whilst in the bath. The plates should also be drained, and the excess of bath solution blotted off the back with filtering paper, otherwise, peculiar wavy markings are liable to be produced. Dust and insoluble particles floating about in the collodion, or any of the solutions, carefully as they should be avoided in any photographic process, must, in this case, be especially guarded against. Even with every precaution to insure success, the operator must make up his mind to occasional failures when working with glycyrrhizine in the bath. The whole action of this resin-sugar is veiled in obscurity and uncertainty.

(To be continued.)

A Catechism of Photography.

IV.—GENERAL PRINCIPLES OF PHOTOGRAPHY.

Q. What does the art of photography comprehend?

A. The art of photography comprehends the whole of the operations of which the object is to obtain a picture by the action of light.

Q. Upon what principles do these operations depend.

A. Whatever may be the peculiar process of photography adopted, it is necessary to obtain a sensitive surface; that is to say, a surface which is readily affected by the chemical action of light.

Q. What are the sensitive surfaces generally employed?

A. A chemical combination of silver with other different bodies, chiefly *iodine*, *bromine*, *chlorine*, &c. The iodide of silver is the most important; but when employed alone, the action of the light is slow, and it is preferable, on this account, to use it in connection with other salts of silver, such as bromide, chloride, cyanide, or nitrate of silver. By this means the chemical effects produced by light are increased in rapidity.

Q. What distinction is made as to the different kinds of sensitive preparations?

A. These may be divided into two classes, namely, those which produce a picture solely by the action of the light, without requiring any subsequent development; and those which, after being exposed to the light, require to be developed by the application of other chemical action.

Q. How may a picture be produced by the sole action of the light on the sensitive surface?

A. The chloride of silver impregnated with the nitrate of silver, and used in a dry state, is capable, by the sole action of the light, of producing pictures of great vigour and intensity.

Q. Is this the sensitive surface commonly employed?

A. It is chiefly used in obtaining proofs technically termed *positives*. As it is relatively slow in action, it is not used in the camera.

Q. What preparation is used for obtaining those pictures which have to be afterwards developed?

A. Iodide of silver is generally employed, to which is added some other salt of silver, such as the nitrate of silver, which increases the sensitiveness of the surface to the highest degree.

Q. Is a surface so prepared rapidly acted upon by the light?

A. It is so extremely sensitive as to be acted upon by the feeblest ordinary rays, and is therefore specially adapted for taking pictures in the camera.

Q. Is not the sensitive coating affected by light during the process of preparation?

A. The sensitive coating for positives or negatives must always be prepared in a room from which the chemical rays are excluded. When so prepared, the plate, paper, or glass on which it has been formed, is placed in the frame adapted for its reception, and exposed to the light.

Q. What is the effect?

A. The action begins immediately; producing as the natural result, whites, blacks, and half tones, the surface being affected with a rapidity proportionate to the intensity of the light.

Q. How long must the sensitive surface be exposed before it is affected by the light?

A. The time of exposure varies according to the nature of the preparation; it is very short for the collodion plate, and longer for the albumenised paper. Even when the preparation used is precisely the same, the time varies according to the intensity of the light. In this, practice alone can guide the operator.

Q. Has the operator simply to take into account the intensity of light and sensitiveness of the preparation?

A. In taking a picture in the camera, the operator must bear in mind the colour of the object to be photographed, its distance from the camera, and the colour as well as the intensity of the light which falls upon it.

Q. Is a picture taken in the camera visible immediately on being taken from the camera?

A. The images obtained in the camera are usually invisible until they are developed by another process. The chemical agents used for this purpose are very numerous; amongst them are—gallic acid, pyro-gallic acid, sulphate of protoxide of iron, mercury, &c.

Q. How is this operation of developing the picture or image to be performed?

A. The operation must take place in a room from which the chemical rays are excluded, and the process must be conducted with great care in order that it may be arrested at the proper moment, which can only be ascertained by experience.

Q. After the picture is developed, is it affected by the action of light?

A. The surface retaining its sensitiveness would immediately blacken on being exposed to the light; hence it is necessary to destroy its sensitiveness.

Q. How can this be effected?

A. The operation is accomplished in two ways; the preparation may be rendered insensitive, and that portion which is not necessary to the formation of the picture may be removed; the second process, which is generally considered the best, consists in completely eliminating all the unchanged sensitive coating.

Q. How can this be done?

A. By the employment of an agent capable of dissolving the part of the sensitive coating not acted upon by the light, without affecting the picture.

Q. What is the best solvent for this purpose?

A. Hyposulphite of soda. The operation is termed fixing the proof. The pictures are then washed and dried, and if the different operations have been performed with proper care, they may be preserved for an indefinite period.

(*To be continued.*)

MICROSCOPIC PHOTOGRAPHY.—M. A. Bertsch has succeeded in reproducing, by photography, the parasite of the parasite of the bee, by magnifying it 1,000 diameters, that is to say, 1,000,000 times in surface. This acarus, says the *Patrie*, unknown hitherto, is covered with a superior carapace in form of an arched roof. Its claws, armed with air-holes and sharp claws, enable it to fix itself in a powerful manner upon the microscopic insect which carries it about, and at the expense of the feebleness of which it feeds itself. In the mysteries of creation, where ceases these strange series of the infinitely small?

Correspondence.

VIEWS FOR PHOTOGRAPHERS NEAR LONDON.

[Several correspondents have favoured us with suggestions on the above subject. Whilst we beg to offer our thanks to all, we have selected the following extracts, as being likely to interest our readers.]

SIR,—If any of the following suggestions, taken with the many others you will doubtless receive, are of the least use, I am fully repaid. Every place mentioned I have myself visited on foot.

To *Watford* by *slow* train: alight at Bushey station (not going into the town of Watford), then westward to *Hamper Mill*, on the Colne (a gem), an extensive view, looking towards the north-west from a field opposite the entrance gate; then southwards, towards Pinner, from a field near the residence of Mrs. Marsh, may be seen westward *Ruislip Common and Reservoir;* proceed still towards Pinner, from the carriage drive of *Mr. Faulkes* (the outer gates are generally open), Epsom race stand, distant forty miles, may be seen; then to Pinner station, and so home.

Or, having reached *Hamper Mill*, cross two fields, and over a style into *Moor Park*, the seat of Lord Ebury (all public walk), from a spot near the house is a most magnificent view north-east; then, leaving the park by the south-west lodge, is a very extensive view looking west.

Then to Rickmansworth, and home by the Watford station, from which there are late trains.

N. B. Thirty-six gallons of table beer are every day placed in the market-place of the village of Rickmansworth, *pro bono publico*.

Or to Watford station, thence to *Cashiobury*, the seat of Earl Essex, through which there is a public path. To see the beech trees alone would repay one for a journey of 500 miles. There are charming little bits towards *Aldenham*, *Bushey Heath*, *Croxly Green*, *Chorley-wood Common*.

Or go by train to *Bromley*, Kent, then by public conveyance towards Sevenoaks, alight at the *Polhill Arms* on Malmscott hill, and revel for a long day in the beauties of the most lovely scenery, and home by same route.

Or alight at the turnpike gate at Pratt's Bottom, walk to Knockholt, and get admission to *Chevening*, the seat of Lord Stanhope; 'tis thrown open every Wednesday after one. Then go and count the Knockholt beeches till dinner time, and get back to Pratt's Bottom in time to catch the coach.

Or, being at Bromley, go (all public) across *Sir S. Scott's Park*, *Bonner's Park*, or to the best cricket ground in England, *Chislehurst;* have a peep at the *Church*, and return by the road passing through Widmore; these latter famous, *teste* the works of Mr. A. Melluish, Mr. B. Smith, and others.

Then there are not a few, engaged all the week in London, who go by early train to Epsom, and walk over the Mickbarn-downs to Box-hill or Dorking, have dinner, and home by train through Reigate, and *they* can testify to the beautiful views they saw, and the proprietors of the hotels to the huge dinners they ate.

A walk from Gadstone to Reigate passes many beautiful places. The Rook's-nest at *Gadstone*, *Nutfield*, Bletchingley, all rich with quaint old chimneys and gables.

Or go to Abbey-wood station, by conveyance to Bexley Heath, walk to Bexley, then by *North Cray Church* to Foot's-cray; but a visit to this country particularly requires inquiry about conveyances, which are usually in a transition state. There is most beautiful foliage at Foot's-cray Place (Lord Bexley's), and also beautiful spots on the river Crouch.

Or go to Ponders End station, walk to Chingford, then through a part of Epping Forest to Woodford.

Or to Staines, see rectory-house, Ankerwyke yews, &c., cross the bridge, and go by Old Windsor to Windsor.

18th September, 1858. SARAH C. M.

Sir,—Permit me to mention a few spots in and near London, which I think would be available to the photographer.

The first I shall name is Dartford. The camera might be placed close to the railway station. The view would comprise a portion of the river Darwent, but more like a lake than a river, with a good deal of pretty weed floating in the water, and picturesquely surrounded, as it were, with willows and other trees, many of them drooping over the water. At a short distance would be seen a very extensive building, a paper manufactory. I would suggest a walk between Strood and Maidstone, including Darnley Park, and Cobham Hall, the Medway, and the hop gardens (when approaching ripeness). This I propose surveying, as also the country between Dartford and Sevenoaks, which, I am told, abounds with antiquated houses and country scenery. I propose also a walk from Woolwich to Erith. There is a pretty bit between Abbey-wood station and Beadon-well, but it is all up hill, and I found a fly from the station very acceptable (it carried five, and cost two shillings and sixpence). I was not able to photograph this, as I had an engagement a little farther on. Purfleet appears very pretty from the water, and I have no doubt several good views might be taken there.

Between Carshalton church and West Croydon station there are various picturesque views; Carshalton parsonage and Wandle seen from near the church, the road to Beddington, Beddington church, churchyard, house and park, with crows' nests, the Wandle, clear stream weeds, felled timber, &c., Wootten Mill, on the Wandle, towards West Croydon.

Wimbledon Park, approached from the station, would be a quiet place to take some views of foliage.

Doubtless the towing path between Hampton Court and Weybridge would be available, keeping the camera away from the water's edge, in order to allow the towing horses to pass, otherwise both photographer and camera might perform an involuntary summersault on the slack rope.

On, and between Clapham and Wandsworth Common, one or two views might be taken, though, as far as I have seen it, not equal to Hornsey for the camera.

Norbury Park and the Mole may be said to be the perfection of wooded scenery. The parts I know are between one and two miles from the Box-hill station. A good view of Box-hill can be had a very short distance north of the station.

The view from the terrace, or from the Star and Garter, Richmond (or park if allowed), may be mentioned, but I am not very sanguine that it would form a pleasing camera picture. If a sufficient breadth of country were taken to form a panorama, the effect would be improved, but this, I think, could only be properly done with a panoramic camera, not adapted to the tourist of a day.

I understand that Perivale church is the very picture of a country church, and ought to be photographed. I have not yet seen it.

From photographs I have seen, and what I have read of the topography, I should judge that about St. Albans a good deal would be found to suit the camera. I have the treat in store.

One day I mounted Muswell Hill, from Hornsey, and passing the road-side inn, with pond in front, kept to the right, and getting over a style, or between some posts, I found an excellent view of the new County Lunatic Asylum at Colney Hatch from the fields. It reminded me somewhat of Robertson's views of Constantinople.

There is much ground about Hampstead Heath that the photographer might occupy. Mr. Archer once told me that on a clear morning, and early, the Crystal Palace might be seen from the heath, with St. Paul's, as it were, in a valley beneath. There is a secluded nook almost closed in with timber north of Highgate ponds, on the east side of Caen Wood, that would be available on an exceedingly bright day.

Mr. Archer also told me that between Forest-gate station and Leytonstone, were some trees that would form good separate studies.

I saw a magnificent view, by Archer, taken in Eltham Park, but I believe it was by extraordinary favour that he gained admittance.

The scenery is rather hilly and wild about Buckhurst Hill, between Woodford and Loughton. There is a curious oak, split in two parts, both living, between the turnpike, Woodford, and the Bald Faced Stag.

I propose investigating Chigwell-row, Hainault Forest, starting from Woodford station.

There are some pretty bits of the New River, castellated engine house, &c., along the "Green Lanes," running north from Highbury-park, Stoke Newington, and the new church, Stoke Newington, would form a good interior view, I should think, the capitals of the columns being foliated, and there being carved work about the chancel.

There are many days on which fine views might be taken about London; for instance, St. Paul's, and each bank of the river, and bridges; from Southwark bridge, a very retired spot, St. Paul's, and the Temple gardens; Somerset House, and the Houses of Parliament, from Waterloo and Hungerford bridges; the Crystal Palace, the river bank, and Westminster bridge, with a glimpse of Lambeth palace, in one view, from the Strand end of Hungerford bridge. I was much struck with this one magnificent day this summer, and we have had very many such days.

At low water I think a venturesome photographer might take good views of Lambeth Palace, and the Houses of Parliament from the middle of the river. There are a few dry spots. Let him be provided with fishing boots, and a boat not far off, and commence operations as soon before low water as possible.

I may mention that I find the late Mr. Scott Archer's camera an excellent one for working wet collodion in the open air, as it enables me to dispense with a tent. The only chemicals I carry are collodion, silver bath, and developer, with a bath of common water to dip the plate in after developing. Mr. Archer did all his pictures so, and they are equal to any. His improved plate box is a capital contrivance, each plate rests in a separate cell, in the same way as in an ordinary dark slide, resting on the corners only. There is also a plan of ventilating the camera, which is pleasant in hot weather, and prevents the vapour of ether being inhaled. I inclose a print from a negative, over-exposed, which I took last year, on Good Friday, the only whole holiday of the London man of business. That day this year was unfortunately too windy for outdoor operations.

20th September, 1858. W. E. H.

TO REMOVE THE BLACK VARNISH FROM GLASS POSITIVES.—TO OBTAIN STRONGLY PRINTING NEGATIVES FROM FAINT GLASS POSITIVES.

Edinburgh, September 27th, 1858.

Sir,—Your idea of a weekly photographic newspaper appears undoubtedly the right thing at the present time, a time far too advanced for the slow pace of the monthly journals; very good in their way, doubtless, but that way, a way necessarily obstructive of all activity in correspondence,—no mean agent in promoting the development of any science;—so I not only wish you, but consider that by your right decision, you have already more than half achieved an eminent success.

Even in your three first numbers, your answers to querists have thrown much light on some of my own difficulties; while again some of their questions have indicated one or two points where my private experience might be useful to them. Thus, in "*Removing the Black Varnish from Glass Positives*," I would at once say, use chloroform—methylated chloroform for cheapness; it acts like magic, for no sooner has the plate been immersed in a flat dish of the fluid, than the black varnish liquefies, and flows off as if it had never been solid. Thick lumps of the varnish about the edges give a little more trouble, but they, too, yield in not many

more seconds, and to simple contact with the fluid, without any mechanical rubbing. Out of some seventy plates black varnished six months previously only two went wrong, and those from my trying the effect of a wash of distilled water after the chloroform. The moment the water touched the collodion film, it loosened and floated off; but as long as chloroform only is used, you may treat the plate in any way without the smallest danger of injuring the collodion.

When the above opaque positives were thus brought back to their primitive state of transparent negatives, they were far too faint to print from. How, then, to intensify them? On a few I tried a pyrogallic developer and silver, but its precipitation was so very unequal, and there was such continual floating off of parts of the picture under the action of the watery solution, that I soon abandoned that, and availed myself of what is in other cases a natural difficulty, viz., the intensifying of lights and shadows under continued photographic copying. On this principle, from the original very faint transparent negative, was made a transparent positive on glass, stronger in every way in its lights and shades; and from that again was made a second negative, when the black parts could be brought up to such density as to print, if necessary, perfect whites.

One of the plates in the photographically illustrated book recently produced by Mr. Lovell Reeve, "Teneriffe, an Astronomer's Experiment," was printed from such a *second* negative, which, in its turn, was taken through the medium of a transparent positive from a *first* negative, which had actually passed the several earlier months of its existence as an opaque positive, backed up with black varnish, and mounted on a mahogany board, and it was weak even then. Nevertheless 2,000 paper copies have been already printed from it through means of its "second negative," and the public demand will alone settle how many more copies may still be taken. C. P. S.

Photographic Notes and Queries.

SIMPLE METHOD OF FINDING THE FOCAL LENGTH OF SMALL CONVEX LENSES.

Sir,—Can you tell me an easy way to find the length of focus of a view lens?

I purchased a large-angled stereoscopic lens, the focal length of which was stated to be 3¾ inches, thinking it would work quicker. Now, I had been using a 4½ inch focus lens, and, as my camera was not an expanding one, I thought I should have to get a new and shorter one: however, I fitted the 3¾ lens on a temporary front, and found on focussing a distant building that my present camera would do, and that the distance from the ground glass to the lens was between 4 and 5 inches. I expected that it would have been between 3 and 4, if the focus of the lens was 3¾ inches. If you can give me any advice on the subject in the next number of the "News," I shall feel very greatly obliged. J. N.

[Perhaps the following paper, which was communicated some time ago to the *Monthly Notices of the Astronomical Society*, by the Rev. T. W. Webb, may prove useful to many of our readers :—

"The determination of the focal length of a small convex lens is a matter of considerable difficulty, at least in the hands of an amateur. Not only is the process of direct measurement a delicate and somewhat troublesome one, but the result is not satisfactory, as it is complicated with uncertainties, arising from the amount of spherical aberration, which, with a large angle of aperture, may have a considerable effect, from the thickness of the lens, and from the difference of the measure from the centre and from the margin of the posterior surface.

"These difficulties, it is true, are avoided, as to the usual object of such measurements, by the employment of the dynameter, or any equivalent contrivance by which the focal image is measured instead of the focal length; but, as these optical means are not always at hand, it may perhaps be of some use to explain a mode of measurement practised by myself very successfully more than twenty years ago. The requisite apparatus, if it can be so termed, will be described in its original simplicity; a little ingenuity would easily improve it, but even in its first rude trial it was found adequate to its object:—

"Three pieces of cork are perforated by a knitting-needle, so as to slide along it. To the centre one is attached, in a vertical position, and with its axis parallel to the knitting-needle, the lens to be measured; in each of the others is inserted a piece of a sewing-needle, with the point uppermost, and having its length so regulated, that a line joining these points would pass, as nearly as may be, through the centre of the lens. The cork discs carrying these needles are then moved backwards and forwards, till the inverted image of the one needle's point, formed by rays passing through the lens, is seen coincident and equally distinct with the other needle's point, when both are viewed at once through a tolerably strong magnifier applied to the eye, and directed towards the lens. Then, if the needles' points are sensibly equi-distant on each side of the lens—a condition which can be sufficiently attained in course of a few trials—it is evident that they occupy the conjugate foci; and the distance between them being carefully measured with compasses, will be, as a very simple proposition in optics will show, *four times the amount of the focal length of the lens for parallel rays.*

"The apparent defect of this method is the uncertainty whether the points, when the image of one is formed close to the other, are equi-distant from the lens, the setting of which, or its form, unless equally convex on each side, may render actual measurement unsatisfactory. A brief and simple calculation, however, will show, that any uncertainty in the focal length for parallel rays arising from this source of error, would be so small in proportion to the corresponding change in the relative position of the conjugate foci, that the needle-points would be obviously and unmistakably out of their proper places—that is, at very sensibly unequal distances from the lens—before the resulting focal length would be materially affected. On the other hand, the advantages of this method are easily to be recognised. All errors are eliminated which arise from spherical aberration, the thickness of the lens, or the difference between the length of the marginal and that of the central ray; and the quantity actually measured being four times greater than the final result, introduces into the latter a microscopical precision, while the actual process of measurement requires nothing but a careful eye, a steady hand, and a little experience, to insure a degree of accuracy quite sufficient for all practical purposes."]

REMEDY FOR FOGGY PICTURES.

Plumstead, 27th September, 1858.

Sir,—As you are so kind as to answer the queries of your correspondents in the "Photographic News," I have

taken the liberty to ask you if you can give me any idea as to the cause of a certain fogginess which I get upon glass positives? I am but a young beginner, and have not as yet attempted to manufacture my own chemicals, but purchase them from a party who is a fellow workman, and a very good amateur. If I am copying prints or engravings, which I fix against a wall which runs due east and west, I get really good copies, no matter how much black there may be in them; but when I attempt a portrait, for which I am obliged to use a yard, with the sitter's face towards the *west*, the blacks or dark parts of the picture are invariably extremely foggy. I at first thought it was the lens, and fixed a diaphragm between the two lenses in the centre of the tubing; but still the fogging continued. I have since blacked the whole of the inside of the camera and tubing with a dead black. The next thing I tried was to have my bath tested; that was correct. I have since had a new stock of solutions, but it is of no use, the fogging is still there, so that I am utterly at a loss how to account for it. If you, sir, can give me any help in my dilemma, you will oblige

Your sincere well-wisher,
AN AMATEUR.

P. S.—The yard I work in is *very light*, and has a window on the north side, upon which the sun shines from about eleven a.m. to four p.m., but I have screened that. Can you, sir, at the same time, give me a recipe for a good developing solution for glass positives?

[We should recommend our correspondent to try first the following experiment:—Prepare a plate; and after keeping it exposed in the dark room (which must be kept closed during the time) for five minutes, pour the developing solution on, and proceed as if a picture were being developed; fix and wash as usual, and then bring the plate to the light and examine for fog. If there be any, the fault will arise from the chemicals being impure, or the dark room not sufficiently dark; and a repetition of the experiment, with further precautions against the ingress of white light, will soon show which is to blame. If, however, the plate shows no signs of fogging, the fault must lie in the camera, or arrangement of light. Try if the camera is light tight by the method given in vol. i. p. 12, and if it stands these tests, follow the plan given in answer to "No Eyes," vol. i. p. 36.]

ON PRINTING POSITIVES.

DEAR SIR,—A novice in photography has found some difficulty in obtaining a good colour for his positive proofs; his bath gives generally a light brown, occasionally approaching to slate colour, but he wishes to obtain a deep rich chocolate. I give you the form of the bath used. You may from this suggest whether it is likely to produce the colour required. Would you seek for the failure in the manipulation, or in a want of purity in the chloride of gold? I confess I suspect the gold.

TONING BATH.

Hypo.	4 oz.
Distilled water...	4 oz.—dissolve.
Chloride of gold	4 grains
Distilled water	8 oz.—dissolve.

Add this solution to the former one gradually, continually stirring with glass rod.

Nitrate of silver...	80 grains
Distilled water...	1 oz.—dissolve.

Mix with the above solution.

If you could offer a word of advice in your next number of "THE PHOTOGRAPHIC NEWS," I suspect you would oblige many more besides a

NOVICE.

[The above formula is a very good one, with the exception of the addition of the nitrate of silver, which we do not recommend.

Obtaining good rich brown prints does not so much depend upon the toning bath, as upon the strength of the salting and silver baths. Use a 30 grain solution of salt, and 120 grain solution of nitrate of silver, and the pictures will be very brilliant and vigorous, whether the toning and fixing be performed in the above bath, or as recommended at vol. i. p. 33. We are inclined to recommend the latter formula.]

GLYCYRRHIZINE.

SIR,—I shall feel obliged if you will inform me what glycyrrhizine is? I have an idea that it is a substance in the composition of which sugar enters, but beyond that fact I am in ignorance; besides, how and in what stage of the process is it used? ALASCO.

[Glycyrrhizine is an organic compound, half resin, half sugar, but not susceptible of fermentation. It has a great tendency to enter into combination with bases, and unites with the alkalies and earths forming compounds soluble in water. It may be prepared as follows:—Make a concentrated decoction of liquorice root, strain the solution from the woody fibre, and then add dilute hydrochloric acid until no more precipitate falls. Filter and wash the precipitate on the filter with a little cold water until the filtrate is free from any acid reaction; then dissolve the precipitate (which is impure glycyrrhizine) in alcohol, and evaporate to dryness at a gentle heat; the glycyrrhizine will be left behind in the form of a brilliant transparent brownish mass. It is sparingly soluble in cold water, especially if acidulated, more so in hot water, and very soluble in alcohol; it has a sweetish taste, and leaves a disagreeable bitterness in the mouth. It was first employed in photography by Mr. Hardwich. See answer to G. B., vol. i. p. 35, and the article on "Accelerating Agents" in the present number.]

BACKGROUND WITH LIGHT CENTRE.

MR. EDITOR,—I shall take it as a great favour your informing me what is the best background I can use for general purposes? I saw a negative from Hennah and Kent's the other day, that had a nice artistic light thrown about the head. Can you tell me how it is accomplished? I have generally used one painted in distemper, and have tried to paint in a light on the background, but it did not answer. Is there any peculiar way to throw a light on it? I thought of having a background of thin material, with a round window behind it. Do you think it will answer? I have so seldom seen good backgrounds in pictures, that I take it there must be some secret in it. I read in a contemporary of having a dark curtain to draw, but that would not give a halo. If you can give me any information on the subject in your next paper, I shall esteem it as a great favour.

In all the papers I have read on photography, and they are nearly all the works published, I have not seen any really good information about background, which would be useful to both amateurs and professionals. J. B. P.

[The effect of light behind the head of a sitter may be easily produced in the following way:—Take the portrait with a very light background behind it, and after printing a positive from it, place the latter, before fixing, in the printing frame, and cover the whole of the figure with opaque paper, cut roughly out of the proper size, and pasted on the glass; then arrange

cotton wool in the centre of the picture, so that the light may be obscured to the required extent, and again expose to light. A little care is required, but the result is well worth it. We believe there are other methods of producing a similar effect, but we are not in possession of the *modus operandi.*]

DISPOSING OF POSITIVE PRINTS.

Dear Sir,—I am an amateur in the photographic art; and having seen in your first three numbers the kind and also practical manner in which you have answered numerous correspondents, I am emboldened to tax your courtesy myself, merely pleading as an excuse a "Constant Subscriber."

In the first place, I am not so placed in life that I can afford the numerous trifling expenses in the prosecution of the art without an equivalent remuneration, merely to cover the expenses of working stock and apparatus.

I have a stock by me of positive prints, printed from various negatives, which I believe to be of a very good quality. Can you tell me how I may dispose of copies, so that I can clear my working expenses?

If you could, in your press of business, find time to tell me who are buyers of those articles, and about the prices given, you will indeed oblige

Your obedient servant and well-wisher,

Photo.

[We do not think we can serve "Photo's" purpose better than by giving insertion to the above letter, and asking if some of our correspondents can favour us with suggestions on this point. Doubtless many amateurs would be glad of similar information, and if we can assist them in any way we shall feel great pleasure in so doing.]

ANSWERS TO MINOR QUERIES.

Queries on the Honey Process.—*C. E. W. H.* has several times attempted and failed with the honey process, and asks several queries on the subject. We give the information asked for, but, at the same time, must say that in our hands the honey process has not proved nearly so successful as either the oxymel or Fothergill process. The time which may be allowed to elapse between applying the honey and developing the picture, should not exceed three days, and the exposure may take place at any point of the intervening time. We find it better to throw away the first portion of honey and water poured over the plate, and then to pour on a second portion, which may be allowed to remain for two or three minutes, and then poured back into the bottle. It will be found a good plan to rest the plates face downwards in a basin, with boiling water, to within half an inch of the plate, before developing; after being thus steamed for ten minutes, the honey can be sufficiently removed from the plate by a few rinses in cold water, to allow of the development to be proceeded with. The process will not answer for positives. The organic matter in combination with the nitrate of silver, on the surface of the plate, produces a slight decomposition, which would give a veiled effect to the positive. See the remarks on this subject, in vol. i. p. 24.

Printing Positives on Ivory.—*An Amateur Subscriber* is desirous of knowing how, when, and where the process of printing positives on ivory may be learned. We have had very little practical experience in this matter; and, although we have succeeded sometimes in taking good pictures on ivory, the process we adopted is not sufficiently certain for us to give it as a reliable one for amateurs. Other better processes are in existence, and we shall feel obliged if some of our correspondents who may have been successful will favour us with information on this subject.

Glass Transparencies for the Magic Lantern.—*A Subscriber* desires information on the above point. In our answer to *J. C.*, vol. i. p. 22, we gave the results of our experience on the subject of transparent positives. They will be found well adapted for the magic lantern if *plain* glass be used instead of ground glass for printing them on.

Blackening of the Positive Silver Bath.—*J. P.* has a sixty grain positive silver bath which has been used for making albumenised paper sensitive, it has turned black and deposited a black sediment at the bottom. Pure china clay (Kaolin) added to the bath in the proportion of about half an ounce to the pint, and well shaken together, will decolorise it and restore its good properties. The addition of oxide of silver has also been recommended, and we should think exposure in a flat dish in the sun would prove an effectual remedy, but we cannot speak positively of the latter plans.

Artificial Light for Night Photography.—*W. T.* wishes to know how a composition may be prepared which will give a brilliant light suitable for photography at night. The following is the receipt for, we believe, the best white fire known; it is the signal light composition employed by government:—

Nitre	7 lbs.
Sulphur	1 „ 12 oz.
Orpiment...	8 oz.

This last body is sulphuret of arsenic, and consequently the fumes from the burning composition are very poisonous, and must be carefully carried off by a chimney.

TO CORRESPONDENTS.

F. P. G.—The paper negative you inclosed would, in our opinion, have turned out very well had it been developed longer; it is very clean, and has all the appearance of a good negative when half developed. If you find your process will not give intense negatives on further development, try the calotype process in the present number.

Σκοτος.—If you follow the process given in vol. i. p. 33, employing one part albumen to three parts water as the solvent, you will obtain very good prints with hardly a perceptible glaze on the surface. We decidedly recommend a stereoscopic camera, with twin lenses.

Bovium.—The reason must be either an insufficient strength of fixing solution, or a peculiar state of the pyroxyline in the collodion; for which see vol. i. p. 36.

Subscriber.—The only objection to the employment of sensitive dry collodion plates for portraiture is their slowness. If you can overcome this difficulty by means of more light, or larger aperture to the lens, they would be as good as any for negatives. We cannot recommend particular houses; consult our advertising columns.

An Unsuccessful Beginner.—The method will soon appear in our "Catechism."

T. C.—Thirty seconds in a good light is an enormous time to expose a collodion plate for a portrait. The fault must be in the lens; for if the silver bath be in good condition, and the collodion made by any well-known maker, a good lens will not require more than three or four seconds exposure. We do not know the reason of the second fault; it is a very general one; perhaps a little bromide of cadmium in the collodion would remedy it. See fifth answer to "Caustic," vol. i. p. 21.

S. J. T.—We are sorry we cannot help you further than by recommending you to study our "Catechism" and "Chemistry," and refer from time to time to the advertising columns. Experience is what you chiefly want.

L. T.—We are not aware that there is any establishment near London, where one could borrow books on photography (as from a circulating library), or have the use of chemicals for experiments in the same by payment of a small sum. Such an establishment would in our opinion prove a great boon to amateurs, and we should think would prove of some benefit to the proprietor. 2. We cannot undertake to give that kind of information. 3. The use of the ½ grain of iodide of potassium in the formula for the nitrate bath, is to saturate the nitrate of silver with iodide of silver, and thus prevent the iodide on the film from being eaten away in the bath.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, Bell's Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 5.—*October* 8, 1858.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE twenty-eighth annual meeting of this important association was held this year in the enterprising and flourishing town of Leeds. The reports which daily appeared in the morning journals during the sittings of the association, gave sufficient evidence that the various departments of science were receiving due and careful attention at the hands of the several committees which were appointed to superintend the separate sections. Photography, as a matter of course, received proper attention; and as this is the particular department in which we are most interested, we have taken the trouble of collecting all the information which we could upon the subject, and we are glad to say, that our applications have met with prompt attention on the part of those gentlemen who contributed papers on that occasion. We beg to thank them for their courteous liberality. Whilst photography has been made the subject of separate, and specific consideration, it is not a little pleasing to see the very general manner in which it was alluded to in other sections of the association. For instance, in the magnificent opening address of Professor Owen, there is a retrospect taken of photographic progress, which, however, we are sorry to say, is not over correct in many of the facts and details. He proceeds to say, that "Photography is now a constant and indispensable servant in certain important meteorological records. Applied periodically to living plants, photography supplies the botanist with the easiest and best data for judging of their rate of growth. It gives to the zoologist accurate representations of the most complex of his subjects, and of their organisation, even to microscopic details. The engineer at home can ascertain, by photographs transmitted by successive mails, the weekly progress, brick by brick, board by board, nail by nail, of the most complex works on the Indian or other remote railroads. The physician can register every physiognomic phase accompanying the access, height, decrease, and passing away of mental disease. The humblest emigrant may carry with him miniatures, such as Dow could not have equalled in the perfection of their finish, of scenes and persons which will recall and revive the dearest affections of the home he has left."

We also notice, in a report of the Kew Committee of the British Association, that photography has been called into requisition for the purpose of recording observations. It says, "The photo-heliograph, erected in the dome of the observatory, has been repeatedly at work since the beginning of last March, and excellent photographic pictures of the solar spots and faculæ were obtained. Certain alterations have been made by Mr. Welsh, in order to regulate the time of exposure of the collodion plate to the sun's action; with these alterations, the instrument gives very good results; but certain improvement in the arrangements of the secondary magnifying lens are under consideration, with a view of avoiding the depiction, on the collodion negative, of the inequalities of the glasses which compose it. The committee recommend that arrangements should be made for the appointment of a competent assistant, who will undertake the taking of photographs, and the preparing of a certain number of copies for distribution to some of the principal British and foreign observatories." To follow out this recommendation of the committee, there will be necessarily an increase of expenditure, amounting to nearly £150 per annum.

But by far the most important allusion to photography is that made by Sir John Herschel, in his introductory remarks as president of section B, devoted to chemical science, which, for close reasoning, acute observation, and the logical arrangement of facts, make it one of the most brilliant speeches which we ever recollect having been delivered on photo-chemical science. He says:—

"Hitherto the more attractive applications of photography have had too much the effect of distracting the attention from the purely chemical question which it raises; but the more we consider them in the abstract, the more strongly they force themselves on our notice; and I look forward to their occupying a much larger space in the domain of chemical inquiry than is the case at present. That light consists in the undulations of an ethereal medium, or at all events agrees better in the characters of its phenomena with such undulations, than with any other kind of motion which it has yet been possible to imagine, is a proposition on which I suppose the minds of physicists are pretty well made up. The recent researches of Prof. Thomson and Mr. Joule, moreover, have gone a great way towards bringing into vogue, if not yet fully into acceptation, the doctrine of a more or less analogous conception of heat. When we consider now the marked influence which the different calorific states of bodies have on their affinities—the change of crystalline form effected in some by a change in temperature—the allotropic states taken on by some on exposure to heat—or the heat given out by others on their restoration from the allotropic to the ordinary form (for though I am aware that Mr. Gore considers his electro-deposited antimony to be a compound, I cannot help fancying that at all events the state in which the antimony exists in it is an allotropic one),—when, I say, we consider these facts in which heat is concerned, and compare them with the facts of photography, and with the ozonisation of oxygen by the chemical rays of the electric spark, and with the striking alterations in the chemical habitudes of bodies pointed out by Draper, Hunt, and Becquerel; and when, again, we find these carried so far that, as in the experiments of Bunsen and Roscoe, we find the amount of chemical action numerically measuring the quantity of light absorbed—it seems hardly possible not to indulge a hope that the pursuit of these strange phenomena may by degrees conduct us to a mechanical theory of chemical action itself. Even should this hope remain unrealised, the field itself is too wide to remain unexplored, and, to say nothing of discovery, the use of photography merely as a chemical test may prove very valuable, as I have myself quite recently experienced, in the evidence it has afforded me of the presence in certain solutions of a peculiar metal having many of the characters of arsenic, but differing from it in others, and strikingly contrasted with it in its powerful photographic qualities, which are of singular intensity, surpassing iodine, and almost equalling bromine."

We have pleasure in presenting our readers with abstracts of the more specific papers which have been read on the subject of photography, as the demand on our space prevents the possibility of giving these papers at length. Mr. Lyndon Smith, in a paper "On the Choice of Subjects in Photography," said:—

"It was the grand reproach thrown against photography that it was a merely mechanical operation, and that its votaries need not necessarily possess taste, imagination, or even a knowledge of the rudimentary elements of pictorial art. A writer in the last number of the *Art Journal* states that his object is to show that no mechanical process can long supersede the living agency of man's mind, and that photography is and never can be anything more than a servant of servants; and the writer attempts in a long and tedious exposition to prove by arguments neither novel nor ingenious the utter inadequacy of photography to maintain the position in which its admirers would place it. Now these remarks, he was aware, would make not the slightest impression on genuine disciples of the art, but he introduced them because adverse criticisms were in some measure merited by the ill choice of subjects the majority of photographers, both professional and amateur, often made, the former generally styling themselves photographic 'artists,' with what impropriety their specimens too often showed. However, within the last two years there had been very great improvement. The *art* in the first days of photography was totally lost sight of in the excitement

produced by the marvels of the *science*, and it is but lately that the camera has been transferred from the hands of the chemist, who has taught us indispensable knowledge, and to whom we could not be sufficiently grateful, to the hands of the artist, who now demonstrates daily the beauty and truth of its representations. The most common subjects represented have been architectural, and the French photographers have arrived at a great amount of perfection in this department, yet in even the best of their pictures there is often a want of taste in the point of view selected. They are too often taken from an elevation, to prevent the inclination upwards of the camera, (which causes the upright lines to converge), and, consequently, there is a loss of magnitude, and the beauties of perspective are diminished. Again, they are generally 'full front' instead of 'in perspective,' which latter position is always more picturesque. But it is in landscape that the glorious fidelity of the camera, when its direction is controlled by the true artist, is most evident. None but he can experience the delight of catching the most transient effects of ever-changing nature. It is in this direction that the glorious future of artistic photography lies, and the true lover of nature will delight more in a specimen of this class than in scores of hasty sketches, even by clever men, or in the gaudy and meretricious colouring of the pre-Raphaelite, vainly attempting to delineate, by the hand, that which the sun himself paints for us in the photograph with such exquisite detail. Photographers are generally too frightened of getting the sun in the camera, as they say, and take their views with its back to their best friend, and thus they lose all the cross shadows which give a stereoscopic effect to a picture, and, in fact, get hardly any shadow at all; as with the sun in the position mentioned, the shadows are all behind the different objects composing the view. He had invariably found that the most pleasing pictures were taken with the sun shining right on the front of the camera, and nearly into the lens, but in this case the precaution must be taken to shield the lens from the direct rays of the sun by the hand or otherwise. Water in motion is rarely reproduced with success, except in instantaneous views, and for the present that must be left to the painter, who, by the aid of white paint and hard brushes, can give us any amount of cataract. The painter himself even condescends to use the camera for the depiction of foliage and herbage, and photographic studies of foreground are most generally admired for the extreme delicacy with which the veinings and markings of the tenderest herb or flower are delineated; still it must not be forgotten that foregrounds are most lovely when adjuncts to an extended view. The study of composition is as necessary to the photographer as to the painter, and every student of the art may derive much benefit from the study of J. D. Harding's 'Principles and Practice of Art,' which, containing much from which many will dissent, conveys to an inquirer much useful and practical information. With reference to the latter portion of his subject, Mr. Smith mentioned that calotype paper was, in his opinion, suitable for giving bold effects, though open to objection on account of its want of clear definition and its granular surface. The wax paper was more homogeneous, but both methods are now generally exploded. Albumen on glass gave exquisite definition, and was most successfully used for taking engravings and paintings, on account of the clearness of lines and the absence of dirtiness in the white parts, a fault to which collodion is liable. In his opinion, the albumen on glass process could not be improved upon by any of the modern processes to which Mr. Ward had alluded. After all, the collodion process was undoubtedly the best, notwithstanding the inconvenience attending its use. The collodio-albumen process, so much advocated at present, appeared to him extremely unsatisfactory, though the confidence of its supporters was unbounded; and as to the dry collodion process, by it no satisfactory effects have yet been produced, though every effort had been made by its advocates. He concluded by hoping that the remarks he had made might excite discussion, that so any fallacy might be confuted, and any truth confirmed."

A letter from Mr. W. McCraw, of Edinburgh, to Sir D. Brewster, "On a new means of preventing the fading of photographs," was then read. To accomplish this object, Mr. McCraw had adopted the following formula:—

"1. Take the white of eggs and add about 25 per cent. of a saturated solution of common salt (to be well beaten up and allowed to subside). Float the paper on the albumen for 30 seconds, and hang up to dry.

"2. Make a saturated solution of bichromate of potassa, to which has been added 25 per cent. of Beaufoy's acetic acid. Float the paper on this solution for an instant, and when dry it is fit for use. This must be done in the dark room.

"3. Expose under a negative in a pressure frame in the ordinary manner, until the picture is sufficiently printed in all its details; but not over printed, as is usual with the old process. This requires not more than half the ordinary time.

"4. Immerse the picture in a vessel of water in the darkened room. The undecomposed bichromate and albumen then readily leave the light and half-tints of the picture; change the water frequently, until it comes from the prints pure and clear.

"5. Immerse the pictures now in a saturated solution of protosulphate of iron in cold water for five minutes, and again rinse well in water.

"6. Immerse the pictures again in a saturated solution of gallic acid in cold water, and the colour will immediately begin to change to a fine purple black. Allow the pictures to remain in this until the deep shadows show no appearance of the yellow bichromate. Repeat the rinsing.

"7. Immerse finally in the following mixture:—

Pyrogallic acid	2 grains.
Water	1 ounce.
Beaufoy's acetic acid	1 ounce.
Saturated solution of acetate of lead	2 drachms.

This mixture brightens up the pictures marvellously—restoring the lights that may have been partially lost in the previous part of the process—deepening the shadows, and bringing out the detail. Rinse finally in water, and the pictures are complete when dried and mounted.

"The advantages of this process may be briefly stated as follows:—First, as to its economy; bichromate of potassa at 2d. per ounce is substituted for nitrate of silver at 5s. per ounce. Secondly, photographs in this way can be produced with greater rapidity than by the old mode. Thirdly, the pictures being composed of the same materials which form the constituent parts of marking ink, it may be fairly inferred that they will last as long as the paper on which they are printed."

In our next number will be given the remainder of the papers bearing on photography, which were read before the British Association.

THE COMET.

During the months preceding March last great preparations were being made in the photographic world to take photographs of the eclipse of that orb which plays such an important part in the economy of photography. But, unfortunately, the weather prevented the possibility of obtaining anything like a satisfactory picture; indeed, nothing worth speaking of was obtained. These attempts to perpetuate the occurrence of events which occur at lengthened intervals are important, not only to contemporaneous astronomers, but likewise as records, that may be handed down for the guidance and observation of future astronomers.

It is, therefore, not a little surprising, that while photographers should have been so fully alive to the importance of taking views of the eclipse of the sun, nothing is being done at the present moment to record the visit of the brilliant long-tailed "celestial vagabond," which nightly attracts such an amount of attention, both from the scientific, and the mass. To take a view of the comet by means of photography, we are of opinion that an astronomical telescope would not be sufficient, both because the light would be too feeble, and because the field of view would be so very limited, not embracing more than about a degree, whilst the comet extends over nearly thirty degrees.

We think that a portrait combination of as large an aperture and as long a focus as could be obtained, would answer the purpose best, if means were taken to neutralise the movement consequent upon the rotation of the earth, by mounting it equatorially, and driving it by clock-work, or similar power, as in many astronomical telescopes. It is not to be expected that persons could in any moderate time fit up a camera in this way, but there are in England many telescopes mounted as above, and all that would be requisite, would be to fasten the camera on to the telescopic tube, so that it could be driven by the same machinery. At present the nucleus of the comet is as bright as a star of the first magnitude, and would probably produce an impression on a sensitive collodion plate in the fraction of a second; but many minutes' exposure would doubtless be required to obtain an impression of its tail.

ON THE CALOTYPE PROCESS.*

When they are required for the camera, the next proceeding is

To Sensitise the Sheets.—Make the aceto-nitrate solution as follows, and call this No. 1:—

80 grains nitrate of silver.
1½ drachms glacial acetic acid.
1 ounce distilled water.

One thing to be attended to here is, that the acetic acid be really the strong acid, if it is not, the whites will grow brown during the development, and so ruin the negative; owing to this cause, I could never print from my first photographic attempts, and the very first pictures I took, when I discovered this, were as good as many *exhibition pictures* of the present time.

Make a saturated solution of gallic acid in cold distilled water, and call this No. 2. Here the amateur must remember that gallic acid requires an hour or two to dissolve in water, and a great quantity of water takes up a small proportion only of gallic acid, or, to give the exact chemical language, gallic acid requires 100 parts of cold water to dissolve it, so that about five grains to an ounce is as strong as the solution can be made. Take then

1 drachm of No. 1 solution.
1 drachm of No. 2 solution.
2½ ounces distilled water.

This quantity will excite a great number of 9 × 7 sheets, which is the size, perhaps, most used. To apply this, I prefer the glass rod; pour a small quantity of the liquid on the top of the sheet, which must be placed on blotting paper, then, with the glass rod, stroke it along, and, as the liquid follows, it will be easy to spread it over the whole surface. With Turner's paper the mixture flows readily, but with Whatman's some few seconds are required to overcome a kind of greasiness which shows itself invariably on his paper. It is, however, soon overcome; and when the sheet seems well charged—which will take a minute, perhaps—blot off the remaining liquid, and place in the dark slide, or, if in a book, betwixt each sensitive sheet lay a piece of blotting paper—this is now fit for exposure. But before I describe that, let me here remark, that in some of Turner's paper there were very many metallic spots, which spoiled my pictures; after experiments, almost innumerable, to get rid of these, I added 6 or 8 drops of acetic acid to every 10 of the silver solution in the exciting solution, termed No. 1; to this, I used to add 1¾ or 2 ounces of distilled water instead of 2½; and, by this treatment, almost all of the iron spots disappeared, and the same paper (before deemed worthless) I always used with success as great as I could expect from any process. Now I return to

The Exposure.—This should not be delayed more than thirty-six hours, but it may take place even when the paper is just excited. I have obtained good pictures with sheets which had been prepared a week, but there is no certainty after the expiration of the above time. As to the time of exposure, with a lens fourteen or fifteen inch focus, diaphragm half inch, in full sunshine, it would require five or six minutes; but, of course, by less diluted sensitising liquid, the exposure may be reduced by one half the above, but its keeping quality and its certainty would be lost. Expose for the shadows, as this paper does not solarise.

Developing the Picture should not be deferred more than forty-eight hours; and, if possible, it should be done before. To accomplish this, take one part of the 30 grain aceto-nitrate solution (No. 1), and two parts saturated solution of gallic acid (No. 2), mix, and apply with glass rod, keeping the surface well and evenly covered with the mixture; from ten minutes to an hour is required to bring out the picture, but the proportions given above may be varied to suit the exposure. If the picture has been exposed a long time—as will be necessary if the shadows are very dark—use one part of No. 1, and four or five of No. 2, as the before-mentioned strength would embrown the picture. In this state the process requires the greatest care, as the blacks are dense *to the eye*, when they are far from it if examined by transmitted light. Indeed, I always develop a little more than most men, as, by this, I gain more decision and sharpness, and a little, though very little, is lost in

Fixing the Picture, which is done by steeping the negative in a solution of 1 ounce of hyposulphite of soda to 6 ounces of water, until the yellow colour disappears from the paper; this takes from five to fifteen minutes, and then it must be washed through six or eight changes of water, for twenty-four or thirty hours, to get rid of the hyposulphite of silver; when this is accomplished, dry; when thoroughly dried, lay the picture on some hot or warm surface, and rub with white wax until thoroughly saturated; then place it between blotting paper, and iron it with a hot iron, until all superfluous wax is taken from the surface. This completes the process, and the negative is now ready to be printed from.

Before closing this description, I have one thing to mention as the greatest cause of failure in the process, viz., want of cleanliness. The gallo-nitrate measures, &c., should be washed well, and now and then with cyanide of potassium solution. If this is attended to, I know no particular cause of failure.

Θ

* Continued from p. 38.

MR. POUNCY'S CARBON PROCESS.

It will be remembered that the discussion on this subject originated in the publication by us of a translation of the process employed by MM. Garnier and Salmon for the production of carbon proofs. This was followed by a letter from Mr. Pouncy, in which he denied that his process in any way resembled that described; and subsequently by another letter, in which he proposed to submit specimens of pictures taken by his process to us for our opinion. This he has since done, and we have now before us two carbon proofs—the one a print from a photograph of a farmhouse; the other, a portrait of Capt. Cook, the celebrated navigator. With respect to the first, our opinion is, on the whole, favourable; the great difficulty—the delicate rendering of the half-tints—being most successfully overcome. We could scarcely desire anything more perfect than the representation of the farm-house and the neighbouring ricks. The picture is, however, to a certain extent, disfigured by the trunks of two enormous trees, which present a somewhat blurred appearance; this, however, is more the fault of the negative, as it exists to almost an equal extent in a silver print which we have seen of the same subject. It has also a reddish tinge, which we should not have expected to find in a carbon print; but

this, Mr. Pouncy informs us, arises from his having added some red colouring matter, with the object of making it resemble more closely the appearance of an ordinary photograph. In the second picture—the portrait of Capt. Cook—the defect we have pointed out in the preceding does not exist. The portrait is, in fact, everything that could be desired; each detail is rendered with the utmost distinctness; and very few persons, we imagine, would be able to distinguish it from the original engraving from which the negative was obtained.

We must beg our readers to remember, that the opinion we have expressed refers to the pictures as such. That they are really carbon prints we do not affirm, inasmuch as we know no more of Mr. Pouncy's process than any one of our readers. The portrait of Capt. Cook certainly presents all the appearance we should have expected to find in a carbon print—more we cannot say.

In forming our opinion, we have not been influenced in the slightest degree by the extenuating circumstance urged by Mr. Pouncy—that his process has not undergone the experience of more than fifteen months—seeing that a process of this kind once discovered, can be perfected as well in fifteen months as in fifty years.

We observe that an enthusiastic contemporary has put forward a suggestion, urging photographers to subscribe £100 for the purpose of purchasing Mr. Pouncy's secret. Whether this proposition has been sanctioned by that gentleman we are not aware; we certainly think it scarcely probable, as in that case he would give up his chance of obtaining the prize of 8,000 francs offered by the Duke de Luynes, which, if we may rely on his statement, we think he has an excellent prospect of gaining.

Critical Notices.

THE PHOTOGRAPHIC EXHIBITION AT THE CRYSTAL PALACE.

CONCLUDING NOTICE.

The next person whom we have to notice in compositive photography, is Mr. Grundy, of Sutton Coldfield, near Birmingham. There is nothing new from the studio of that gentleman in the present collection. Already we have seen the whole of his productions at former exhibitions. There is a great and very perceptible difference between the style of Mr. Robinson and that of Mr. Grundy. The former, as we have shown in our last, attempts to delineate sentiment of a high class; and more or less illustrates poetic subjects. The latter chooses subjects from every-day life, and in contradistinction to Mr. Robinson, portrays the real, rather than the ideal. He is to photography what Teniers and Wilkie were to art. He portrays, as they did, those characteristics of human nature which are seen in every-day life. His most successful pictures are decidedly Dutch in feeling, and, therefore, more or less gross. By this we do not mean anything derogatory to the class of picture, any more than that Dutch pictures of the highest class never exhibit anything bordering on the ideal. We all know that even when sacred subjects are being treated by Dutch masters, the character which is sacred and holy receives the same treatment as the most profane subject would. To illustrate more fully what we mean, we may merely recall to the mind of the reader any of the pictures by the Dutch masters of "Christ insulted," and as an invariable rule, it will be found, that the figure representing the Saviour is of exactly the same type as those cruel mockers who surround him—and those are generally drunken Dutch boors. So that it will be seen that there is seldom or ever on the part of Dutch masters any very poetic flights. They are almost photographic in their transcripts of interiors, and this enables Mr. Grundy to enter fully into the spirit of Dutch composition. They never crowd their pictures with useless detail; on the contrary, everything will be found in its proper place, and an examination of the detail only heightens the interest of the beholder, by the wonderful power which they display of imitative talent. Mr. Grundy groups with a care, accuracy, and precision, which is far from painful.

By this we mean, that crowding of objects into pictures which some photographic composers seem to think the acmé of perfection, but which inspire in the mind of the beholder no more ennobling idea than would a walk through the Lowther Arcade; and which are in fact more like copies of the interior of a bazaar than anything which had been arranged so as to give artistic effect. Mr. Grundy's studies of "Fishermen" ought to be highly prized by artists, as there is such an amount of care and tact displayed in the grouping. We cannot speak so highly of his Turkish studies. They are admirable in their arrangement, and a great knowledge of the costumes of that country is shown in the pictures; but the faces are decidedly Anglo-Saxon, and this, we think, spoils the whole beauty of these pictures. Who that has seen the two *chefs-d'œuvres* entitled, "Dutch Fishermen," can withhold his admiration? They combine the greatest amount of perfection which we may reasonably expect in this department of art. There is such clearness in the tone of the picture, such true feeling in the expression of the Fisherman's face, such exquisite detail in regard to the furniture of the interior and the dress of the figure, even to the darned stockings, the wooden clogs, the stunted chairs and tables, the oval goblet, all of which strongly call to mind a copy of a picture by Teniers at his best period. The best reason which we are enabled to give for the success which attends this class of picture is, that it is taken at one view; therefore, nothing is out of drawing, and there are none of the harsh combinations which may be seen in pictures which have been made up of several pieces. The results of Mr. Grundy's endeavours are successful to a certain degree, and this we apprehend arises from the fact of his having good models.

Then we come to two or three attempts at composition which exhibit this branch of the art under the worst possible circumstances. They are entitled "The Dutch Girl on Sunday," and "The Dutch Girl on Monday." The first is a picture of a girl dressed in anti-Maccassar table covers, with no possible artistic effect; and why she should be denominated a Dutch girl at all, or if a Dutch girl, why she should represent a Dutch girl on Sunday, is certainly above our comprehension. We would advise the artist who composed the piece, to give a little more lucid information in regard to the meaning which he attempts to convey. There is certainly nothing in the countenance of the young lady that could justify the most imaginative being in thinking she was a Dutch girl. On the contrary, she has a decided look of a Somersetshire servant maid, who has, in an hour of vanity, arrayed herself in grandeur which ill becomes her. These pictures are really the most stupid compositions we have ever seen, and we think we may with safety venture to advise the artist who has perpetrated them, to retire upon the laurels he has already acquired, lest he produce something of which he shall himself be ashamed.

Dolamore and Bullock exhibit here some very fine views; we believe that they formed a part of the Kensington Exhibition; but, as far as we can recollect, they occupied positions in which we were unable to inspect them.

The views of Warwick, and of Warwick Castle, are about as fine as anything we have seen; there is a great deal of nice feeling displayed in these views; the sites are admirably chosen, and give an idea of a landscape from the best point of view. "The view across the Parterre, Guy's Cliff," is a very fine picture; the perspective is shown with great effect, while the middle tints are admirably given.

"The View of Warwick Castle" is rendered in a manner to show with the greatest possible effect the extent of this noble building. "St. Mary's Porch, Oxford," is a photograph of great beauty, and the rendering of the traceried iron work is really marvellous; the detail is finely given, while the antique sculpture is so well portrayed, as at once to attract attention. Among the minor landscapes are Mr.

B. B. Turner's beautiful talbotype pictures. We cannot help noticing the careful manner in which these pictures are printed, as well as the artistic mode in which Mr. Turner has treated all his groups of trees.

Mr. Wilson, of Aberdeen, has contributed the little gems of landscapes which he exhibited at the late exhibition. These are among the best instantaneous pictures we have yet beheld. Who that has once seen his "Thunder Cloud" can forget the truthfulness with which he has caught the electrically charged cloud, and transferred it to paper, in a manner so as at once to catch the attention of the spectator by its very reality. The views of the "Aberdeen Docks" are equally beautiful pieces of instantaneous photography; and his little picture entitled "Reach on the Don" is one of the most charming little bits of river scenery which we have ever beheld. The ripple of the Don as it flows by, is wonderfully true to nature; in fact, it looks as though the lovely stream was, in reality, gently gliding along at our feet. There are several frames here from Messrs. Ross and Thompson, studies of trees, which we think will recommend themselves to artists, as there is a great deal of botanical knowledge displayed in the selection and grouping of the pictures. Here are also three frames of small studies of landscapes by Mr. Rosling, but only the mention of these is necessary, as there is nothing in them to recommend them, either in an artistic or photographic point of view.

Next we come to Mr. Fenton's views in Wales. We think that nobody will be inclined to dispute Mr. Fenton's unrivalled claim to be the best English landscape photographer. He has succeeded in giving such breadth to his landscape pictures, that one is at first almost inclined to look upon them as copies of pictures. The selection which has been made by the Crystal Palace authorities for the Sydenham Gallery is far from being an adequate representation of Mr. Fenton, and what he can do. We miss that charming pair, the "Swallow Falls" and the "Ravine in the Lledr Valley," which were the decided gems of the South Kensington and Coventry-street Exhibitions. Those pictures deservedly ranked high as works of art, not only on account of the size, but also for the beauty of manipulation. The set of views of Wales are, we hope, but the foreshadowings of still greater efforts on the part of Mr. Fenton. The views on the continent, which were taken by Mr. Bedford at the command of her Majesty the Queen, are here exhibited again. It would indeed be superfluous on our part to do more than even mention such works as these. A verdict has been so generally pronounced in their favour, and they have so well deserved all the encomiums which have been heaped upon them, that we can only say, Go, Mr. Bedford, and charm us again in the same manner.

Having thus dismissed the question of landscape photography, we of course come to the next feature of the exhibition, viz., portraiture. We have already given an opinion upon the productions of Mr. Herbert Watkins; we will, therefore, now proceed to notice briefly the other specimens. First, then, we have to call attention to the series of contemporaneous portraits by Mayall. In regard to these pictures, they can scarcely be called photographs, inasmuch as there is nothing of the photograph left. They are sepia drawings over photography, and, in many respects, there is a decided advantage in this, because exaggerations which sometimes appear in portraits of the defective portion of the face, are toned down in these pictures. The style is peculiarly Mr. Mayall's own; and the manner of producing, in black and white, that Rembrandtish effect, is very pleasing in many instances. The series of portraits of eminent men which Mr. Mayall has collected, are now being engraved in the successive numbers of *Cassell's Illustrated Family Paper*, and no doubt they will be looked upon as highly interesting, besides the value which must attach to them as correct likenesses. Mr. T. R. Williams has the same series as he exhibited at South Kensington and Coventry-street. We think that some new specimens ought to be produced by this gentleman. He takes undoubted precedence among photographers for his untouched pictures, which are really marvellous; they are graceful and easy in attitude, and beautifully printed. But we suspect that the success which attends Mr. Williams in his photographs, arises from the fact, that he seldom or ever prints anything but the head, and in the vignette style; this accounts for the beauty of his pictures, because vignette printing has always more or less charm about it, owing to the lightness which it gives to the figure; and again, there is the absence of that unruly member—to photographers—the hand, which always will obtrude itself upon your notice, whether you will or not. The tinted pictures by Mr. Williams are remarkable for their softness of finish. Then, again, Mr. Williams's daguerreotype stereograms are something which nobody but himself can achieve. There is in them such a charming softness and beauty that they at once attract and interest the visitor; and if we are not much mistaken, the table of coloured daguerreotype portraits will prove a very attractive feature of the exhibition.

There is a series of Maull and Polyblank's portraits, possessing individuality that no one can mistake. These photographers are eminently happy in securing good expression of face, although, in many instances, the *pose* of the figures is anything but pleasing. It would be idle on our part to even enumerate a series which is so well known as this. The next which call for our attention are the carefully finished miniatures by Messrs. Lock and Whitfield. The style in which these are executed is an entire refutation of the erroneous idea that photography cannot be applied to miniature painting. The manner in which these pictures are finished reflects high credit upon the artist, although we would much rather have seen new faces; those at Sydenham are well known to us, as we have seen many of them at Manchester and elsewhere. Then, lastly, there is a frame of coloured photographs, if we remember rightly, by Messrs. Mayer, and they certainly are the greatest daubs we have seen for some time. The positions of the figures are bad in the extreme, but the Wardour-street art, which is used in painting the backgrounds, is something wonderful. In one instance we have a gentleman painted in Arabian costume (we presume), with a background which would disgrace a fifth-rate panoramic artist. It is of a fiery red, and, in the distance, we are led to believe that there is a caravan proceeding on its way to Mecca or some other pilgrim destination, and that the gentleman in the foreground has placed himself there *pro bono publico*, so as to enable the beholder to study the wonders of Eastern costume; while partly in the background is a drawing of what we imagine is meant to be a tent, but which, in reality, would more correctly represent a large glass-blowing establishment. The whole picture might indeed be considered worthy of being engraved on the head of one of those artistic, commercial invoices, in which we now and then see how admirably the engraver's artistic merits are brought forward, and what feats of imagination can be performed. This is a type of the class which adorn a frame. There is every variety of style used for background purposes,—from landscapes such as we have described, to terraces and avenues approaching baronial halls, in the most approved theatrical fashion. We should really like to have the pleasure of seeing the original photograph over which these pictures are printed, so that we might all the more thoroughly appreciate the imaginative efforts of the artist.

Having thus slightly sketched the chief characteristics of this collection of photographs, we desire to express a hope that the day is not far distant, when the present collection shall be replaced by one infinitely superior, and in every way worthy of the art and the Crystal Palace. Let the directors only see that those intrusted with the charge of this department properly discharge their duties, and we will venture to affirm that not one of the least attractive portions of this national building, and national resort, will be the photographic gallery.

Photographic Chemistry.

CHEMICAL SYMBOLS AND EQUIVALENTS.

As promised in our last, we give a list of the symbols and equivalents of those elements most commonly mentioned in photographic works :—

Aluminium	Al	=	13·7	Magnesium	Mg	=	12
Barium	Ba	=	68·5	Manganese	Mn	=	27·6
Bromine	Br	=	80	Mercury	Hg	=	100
Cadmium	Cd	=	56	Nitrogen	N	=	14
Calcium	Ca	=	20	Oxygen	O	=	8
Carbon	C	=	6	Phosphorus	P	=	32
Chlorine	Cl	=	35·5	Platinum	Pt	=	98·7
Chromium	Cr	=	26·7	Potassium	K	=	39
Copper	Cu	=	31·7	Silver	Ag	=	108·1
Fluorine	Fl	=	19	Sodium	Na	=	23
Gold	Au	=	197	Strontium	Sr	=	43·8
Hydrogen	H	=	1	Sulphur	S	=	16
Iodine	I	=	127·1	Tin	Sn	=	58
Iron	Fe	=	28	Uranium	U	=	60
Lead	Pb	=	103·7	Zinc	Zn	=	32·6

SULPHUR AND ITS COMPOUNDS.

In the last number of the "Photographic News" there was an article by M. A. B. on the effect of the fumes of various substances, including sulphur, in reproducing copies of designs under certain circumstances, which we recommend to the attention of our readers as calculated to give them some examples of the chemical effects of the vapours of some of the substances we have referred to. The fumes of burning sulphur, for instance, are a compound of sulphur and oxygen, very pungent to the smell, and acid to the taste. Sulphur is a substance which is itself, as yet, little used in photography; but the contrary is the case as regards the products resulting from its combination, in different proportions, with oxygen. The first we shall refer to is *sulphurous acid*. When free from water, that is, when in the form of the fumes above mentioned, it is a gas, and would continue such under ordinary circumstances; but if it be compressed to half its bulk, or exposed to intense cold, it becomes a liquid. This liquid evaporates rapidly on being exposed to the air, and the cold produced is so great as to be capable of freezing the mercury in a thermometer. The sulphurous acid in ordinary use is formed of water which has absorbed about 35 times its bulk of the gas, the latter having a great affinity for water. Silk, wool, straw, &c., are bleached by this gas, which also discharges the colour of the red rose, and which in its liquid form is used for bleaching sponge.

The addition of oxygen to sulphurous acid produces *sulphuric acid*, the qualities of which are very different. It has not the suffocating smell of sulphurous acid, and it intensifies the colour of the red rose instead of destroying it. Sulphuric acid, in a perfectly pure and anhydrous state, is a volatile, white, solid substance. The solid acid, if dropped on paper, will burn holes in it as rapidly as a red-hot iron; and if thrown into water, causes it to hiss as if a red-hot coal had been thrown in.

Sulphur also combines with oxygen to produce *hyposulphuric*, *hyposulphurous*, and some other unimportant acids.

Sulphur combines with hydrogen in two proportions, forming *sulphuretted* and *bi-sulphuretted hydrogen*. A stream of the former passed through water coloured with a vegetable blue, reddens it. It also forms the fetid gas emitted by rotten eggs, and gives flavour to the waters of Harrowgate, Aix-la-Chapelle, &c. It is one of the most poisonous gases known: air, impregnated with it in the proportion of 1 part of this gas to 250 of common air, would kill almost any animal that breathed it.

Sulphur combines with carbon to produce *bisulphide of carbon;* 31 parts of sulphur, combined with 100 parts of cyanogen, forms *sulphide of cyanogen;* 124 parts of sulphur, combined with 100 parts of cyanogen, form *hydro-sulphocyanic acid*, the principal peculiarity of which is, that if dropped into a solution containing peroxide of iron, it changes it to a deep blood-red colour.

Chloride of sulphur may be obtained by putting a bit of sulphur into a glass flask filled with dry chlorine. It exhibits no acid properties; it decomposes water.

PHOSPHORUS.

Almost the only mode of employing phosphorus in photography is that suggested by M. Nièpce de St. Victor, and referred to in the article by M. A. B. It combines with oxygen in several proportions, and has a strong affinity for water. It is of so inflammable a nature, that exposure to common air causes it to undergo a slow combustion. The fume or vapour it gives off is a combination of phosphorus with oxygen, forming *phosphorous acid*. It combines with hydrogen in different proportions, and forms a chloride, which may be obtained by passing the vapour of phosphorus through powdered corrosive sublimate, which is decomposed, and the chlorine leaves the mercury to combine with the phosphorus.

FLUORINE.

Fluorine also supplies an acid which is occasionally employed in photographic manipulations, viz., *hydrofluoric acid*. When pure, it is so volatile that it is confined with great difficulty, and, when exposed to the atmosphere, gives off fumes of an acid and suffocating nature. Its density is increased by the addition of water, though the latter is a lighter liquid. Vegetable blues are reddened by its action. It also possesses the property, peculiar to itself, of decomposing flint glass, for which reason it has been made available for etching on glass, the mode of operation being, to a certain extent, similar to that pursued in heliographic printing. The glass being coated with a varnish insoluble in the acid—one formed of turpentine and wax will be found effective—the etching is made by cutting through the dry varnish with a fine point down to the glass; a wall of wax is then raised round the plate, and dilute hydrofluoric acid poured on. A few minutes suffice for the acid to eat into the glass, which may then be immersed in water. On the varnish being removed, the design will be found to have been produced with perfect exactness.

(To be continued.)

Dictionary of Photography.

Accumulation in Development.—A very faint collodion picture in which all the details are visible, but with little or no intensity when looked through, may often be converted into a vigorous negative by a

method of accumulating silver on that which is already precipitated.

The picture must be fixed either with hyposulphite of soda or cyanide of potassium, and well washed. If now a mixture of the ordinary pyrogallic acid developing solution and nitrate of silver is poured over the plate, the nascent silver will precipitate on that which is already there forming the picture, and the result will be an increase of density, which, in a short time, will be sufficient to allow of vigorous positives being printed from the plate. One of the most remarkable points connected with this method of accumulation is, that white light is not injurious to the result; in fact, the pictures seem to be intensified just as rapidly and effectually when the redevelopment is effected in full daylight, as when in a darkened room; the only objection being the more rapid decomposition of the developing solution. By well washing off the developing solution when it has ceased to act, and pouring on a fresh mixture, the deposit of silver may be so raised above the surface of the plate, as to admit of an electrotype being taken from it, and this used for printing from in ordinary printer's ink. We have succeeded in obtaining copies from line engravings in this way; the lined surface of the negative being very favourable to the accumulation of silver, in the form best adapted to produce a deeply marked copper plate, possessing excellent qualities for taking the ink, and giving good impressions.

Acetic Acid.—This acid is composed of 4 parts carbon, 4 parts hydrogen, and 4 parts oxygen. It occurs in nature in the juice of many trees, sometimes in the free state, and at others in combination with potassa or lime. There are two principal ways by which it is formed in commerce:—

1st. By the dry distillation of vegetable matter, such as wood.

2nd. By fermentation.

According to the first method the wood is placed in immense iron retorts, and heated by furnaces until it is converted into charcoal, and the vapours which it evolves are condensed. The crude *wood vinegar* thus obtained, requires to be separated from the wood tar with which it is contaminated. This is effected by rectifying it, and subsequently saturating with lime. The crude acetate of lime thus formed, after being submitted to several purifications, is then distilled with a stronger acid, when commercial wood vinegar is produced.

Wine or beer vinegar is obtained when wine, cider, beer, or dilute alcohol is exposed for some time to the air under favourable circumstances. In some manufactories lofty brick towers are erected, with side openings to admit of a free passage of air. The building is now filled with large faggots, and a slow stream of dilute alcohol is allowed to trickle on to them from the top of the tower: this, in percolating to the bottom through the innumerable twigs and branches, meets and combines with atmospheric oxygen, which has free access to it on all sides, and by the time it has reached the reservoir at the bottom, is entirely converted into vinegar. The crude vinegar obtained by either of these plans contains, besides acetic acid, a large quantity of water; frequently, also, unchanged alcohol, cream of tartar, and other salts, gum, colouring matter, tannin, ferment, &c. It is far too impure to be used in photographic operations. It is purified by saturating it with either potassa, soda, lime, or oxide of lead, evaporating until the acetate remains either in the state of concentrated solution, or of crystals, or of a dry mass, and distilling the residue with more or less of dilute sulphuric acid. *Concentrated vinegar* is thus obtained, which, although not sufficiently pure to be used indiscriminately in all photographic operations, may nevertheless occasionally replace the more expensive glacial acetic acid, especially in the developing solution for collodion.

(To be continued.)

A Catechism of Photography.

IV.—GENERAL PRINCIPLES OF PHOTOGRAPHY.

(Continued.)

Q. Is there any simple experiment by which we may learn what takes place in the production of a photographic proof?

A. There is: if some nitrate of silver be placed in a glass, and a few drops of salt and water be added, a white precipitate is formed which is chloride of silver. This is a preparation sensitive to light.

Q. How may this be ascertained?

A. The precipitate if exposed to the light for a few moments changes rapidly from white to violet, and even to black. This decomposition of the chloride of silver corresponds exactly to the formation of the photographic picture on the sensitive plate or paper.

Q. What effect is produced by the application of hyposulphite of soda?

A. If a solution of hyposulphite of soda, after the precipitate has undergone the change already mentioned, be poured upon the precipitate, it partly disappears, there only remaining some blackish particles, namely, those which have been decomposed by the light. The unchanged particles of the precipitate are dissolved by the hyposulphite of soda. This operation corresponds exactly to the *fixing*, as it is called, of the photographic picture. The entire experiment represents the process of obtaining a *positive proof*.

Q. Are there any other simple experiments which illustrate the power and action of the photographic agents?

A. If (screened from the presence of light) a solution of nitrate of silver be poured into two glasses, and a few drops of a solution of iodide of potassium be added, a yellow precipitate of iodide of potassium is produced. If one of these glasses then be exposed to the light, and afterwards taken again into the darkened room,* no apparent change will have taken place. But if a few drops of gallic acid be poured into each of the glasses, the contents of that which has been exposed to the light will blacken rapidly, while in the other, the liquid will retain its yellow appearance.

Q. How is this explained?

A. By the action of light. In one case the light has been permitted to act on the iodine of silver, and the gallic acid combined with the excess of nitrate of silver blackens the iodine, and renders the change obvious. A few drops of hyposulphite of soda will "fix" the precipitate as in the former experiments.

Q. What are we to learn from these experiments?

A. All the phenomena exhibited in photography. Positive and negative impressions upon plates or paper are all founded on these phenomena. They are simply modifications to which certain salts of silver are subjected by the action of light; so that the reducing agent mixed with nitrate of silver blackens more or less the parts affected by the light.

Q. Is the action of light upon chemically sensitive surfaces perfectly understood?

* When we speak of a darkened room, it should be understood that we refer to a room from which the chemical rays of light only are excluded.

A. The chemical study of photography is not yet sufficiently complete for us authoritatively to lay down any general theory. Sufficient, however, is known to enable us to examine doubtful points, and test apparent contradictions, and thus remove many obstacles to our scientific advancement.

Q. What is the fundamental principle of photography?

A. That the production of photographic effects is due to the action of light, and as we have already noticed, that this action is under certain circumstances capable of producing a perfect picture, while under other circumstances its action is only partial, and a subsequent process necessary for its completion.

Q. In what way do you explain the first phenomenon?

A. Chemistry shows us that light produces upon certain substances, in fact upon almost all, an analogous effect to that of heat. At one time it facilitates the combination of different elements. At another, it hastens the separation of combined elements. It is this double influence which it exercises in photography. Thus it facilitates the combination of oxygen with certain organic matters, as bitumen and resin.

Q. By whom was this property of light ascertained?

A. It was shown by the researches of Nièpce, with bitumen of Judea, and by those of M. Chevreul, and M. Nièpce de St. Victor, who have shown that resins oxidise under the influence of light. It is from this fact, namely, the oxidation produced by light, that photographic pictures are obtained.

(*To be continued.*)

Correspondence.

ECONOMISING THE WATER IN OUT-DOOR PHOTOGRAPHY.

No. 19, *Marine-terrace*, *Penzance*,
October 1*st*, 1858.

Sir,—I observe, in your last number, a letter inquiring for the minimum quantity of water that can be carried on a day's photographic excursion, and to answer effectually the end required.

I have much pleasure in forwarding you the result of my experience for the four past years, during which period I have found, for a day's work, a *pint* supply all my requirements, and enabling me, as I have done scores of times, to bring home, and *safely* preserve, eight negatives, measuring 8½ × 6½ inches, and twelve stereoscopic negatives of the usual size. My mode of proceeding is simple enough. I use, and with unvarying success and comfort, an Archer's camera, which contains a wooden water-tight bath, holding barely 16 ounces of water. I, of course, develop *in* the camera; and, after having so done, I plunge the plate into the *water bath*, leaving it for a couple of minutes, and then carrying it out into open daylight, place it in my plate box —of *Archer's construction*—and in which the plates are placed so *close* to each other, that, on returning home from a long day's work (say the first negative having been taken at 10 a.m. and not fixed with the hyposulphite till 10 p.m.), I have never yet had any difficulty, with ordinary care, in being able to clear the negative of the iodide, and leave the film uninjured. The close proximity of the plates to each other keeps them so moist, that when, in the ordinary plate box, the peeling off of the film would inevitably occur, the occurrence of such an accident is rarely met with in the boxes made on Mr. Archer's plan; they are much more portable, in my opinion much safer for a journey, and at half the price of those generally in use. I have now worked for nearly four seasons with an Archer's camera, and find it unexceptionably the best to meet *every* requirement for out-door work. I excite and develop, both the large plates and the plates for my stereoscopic camera, inside it. I seek no dark room—no tent—and am able, of course, before leaving the spot on which I am taking my view, to ascertain if it be good or not. I have this summer taken upwards of three hundred good negatives, and for some of them I have had to travel many a long mile; and, to have returned, as many do, and found all my day's work abortive—and as, before using the camera I now employ, I have often done—would be vexatious enough to deter many a beginner from further prosecuting this most fascinating pursuit.

I consider the minimum quantity of water that can be used with advantage on a day's work, bringing home a dozen negatives, 8½ × 6½, and an equal number of the usual sized stereoscopic plates, to be from 10 to 16 ounces, if used in the mode I have attempted to describe.

I shall be most happy to give any further explanation on the subject if any of your readers wish for the same.

I am, sir, truly yours,
J. W. G. Gutch.

TO TRANSFER GLASS POSITIVES TO GLAZED LEATHER OR CLOTH.

Sir,—If you think the following worth inserting in the "Photographic News" it is at your service.

First, cut your leather or cloth a little larger than your glass positives, lay its face upon a table, then take about ½ oz. of spirits of wine, and add about 4 or 5 drops of nitric acid; shake up, and it is fit for use. Take the positive, after being dried by the fire or otherwise, and pour the mixture of spirits of wine on as for collodion, and when still wet lay it on the leather or cloth, face down, gently squeezing out the air bubbles, and keep them in contact either in the pressure frame or in a book, or any convenient place, until the spirits of wine is dry, which may be half an hour or so; then take out the picture, and separate the glass from the leather or cloth, and the film will be so fixed to the black surface that you cannot even scratch it with the finger nails. It may be well to use collodion a little thicker in cotton for transfers.

The above is a sure, certain, cheap, and easy method of manipulation.

Further information will be given to any one sending a stamped envelope to

John Ostell,
80, Castle-street, Carlisle.

ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES.

Sir,—To amateur photographers, who, like myself, are able to give but little time to copying subjects, and can rarely choose the most favourable moments, the possession of a powerful, steady, and cheap artificial light would be a matter of great importance. To artists also, such an accessory would be very acceptable, I should imagine. In the *Illustrated London News* of the 21st July last, a new light, stated to be the invention of Colonel Fitz Maurice, was there described, and would seem to be just the thing wanted for photography. I have made several efforts to obtain information on this subject, but hitherto have not succeeded in ascertaining whether this valuable discovery can be procured, or whether any patent is in process of being taken out for it. Under these circumstances, any information you can procure will, I think, be very acceptable to your readers, and I trust the subject will be considered worthy of your early attention.

Subscriber.

[We shall be pleased to have further information on this subject, if any of our correspondents can favour us.]

OBTAINING STRONGLY PRINTING NEGATIVES FROM FAINT GLASS POSITIVES.

Brighton.

Sir,—Having perused with interest the few numbers as yet published of the "Photographic News," and noticed your answers to various inquiries, I am induced to trouble you with this note.

In your last number, page 46, your correspondent C. P. S. states, that he has succeeded in intensifying a very weak negative, by first taking a transparent positive on glass, and from that a second negative, in which he was able to procure sufficient density in the dark parts.

If from a positive on glass a negative sufficiently intense to print can thus be taken, *without loss of the sharpness required*, it strikes me it would be a great boon to amateur, if not to professional photographers.

Mammas are always anxious to have likenesses taken of their youngest children,—and as there is no keeping the little urchins quiet, it is a severe trial to the patience of the photographer,—and a successful portrait of a child is seldom seen unless touched up by an artist. With positives it is a much easier matter, and a pleasing smile on a child's face may not unfrequently be caught in one second's exposure.

If your correspondent, or you yourself, could explain the best method of taking the transparent copies on glass, it would be highly appreciated by myself, and other amateurs.

JOB THE PHOTOGRAPHER.

[May we beg the favour of C. P. S.'s kind attention to the request contained in this letter.—ED.]

TO CLEAN A GLASS PLATE.

DEAR SIR,—It may perhaps be useful to some of your readers to know, that old collodion which is unfit for photographic work, is a first-rate material for cleaning glass plates.

The method I have adopted, is to take a small tuft of cotton wool, pour a few drops on the glass plate and rub till nearly dry in a circular direction, then finish with a wash leather.

P. H. C.

Miscellaneous.

PHOTOGRAPHY AND ARCHÆOLOGY.—Mention was made some months back, says the *Journal de Constantinople*, of the mission which M. de Sevastianof, councillor of the Emperor of Russia, had undertaken for the purpose of investigating the curiosities of antiquity contained in the convents of Mount Athos. That spot is stated to be an almost inexhaustible mine of ancient records, and has always been a great point of attraction for artists and scientific men. All those little priories which, from the summit of the holy mountain, overlook the distant isles of the Archipelago, are so many libraries where the monks have been storing up the annals of ages. Materials for history are to be found there in all languages and on all subjects, piled up pellmell, but nevertheless preserved with care by those in whose custody they are placed. M. de Sevastianof has free access to those treasures. The daguerreotype gives him hundreds of copies of the manuscripts, which he takes page by page. Already one-third of the Gospels have been copied, and numerous collections of illuminated maps and pictures have been made. They are in Greek, Sclavonian, and Georgian. Even the outside of the albums which inclose the collections have been copied, and the Byzantine reliefs on their covers have been reproduced. Moulds of them have likewise been taken in gutta percha. Thanks to the co-operation of M. Vaudin, a French painter, the frescoes in the chapels have been copied in the most exact manner. These drawings remind one of the productions of the first Italian painters, Margaritone, Oreagna, Cimabue, Giotto, Angelo de Fiesole, and Pietro Perugino. The example of M. de Sevastianof has found imitators, for already other photographers have arrived on Mount Athos, not to compete with him, but to emulate his zeal. The harvest is abundant, and the sooner artists apply themselves to the task, the sooner will these masterpieces, which were considered as lost, undergo an unhoped for resurrection.

PHOTOGRAPHIC IDENTIFICATION OF STOLEN FRUIT.—A correspondent of our contemporary, "Notes and Queries," writes:—"While the fruit, peach, nectarine, or apricot is yet in a green state affix an adhesive *label*, your initial, or any other private mark to the side exposed to the sun. The *ripe* fruit thus labelled will carry its unobliterated *green* stamp into any market. This simple operation, if it should fail to *preserve* the fruit, will, unless it should have been subjected to any colouring process, at least enable the owner to *identify* it."

Photographic Notes and Queries.

DIFFICULTIES IN THE COLLODION PROCESS.—PAPER FOR THE CALOTYPE PROCESS.—PIN-HOLES IN COLLODION PICTURES.

MR. EDITOR,—Having seen that you kindly undertake to answer questions on photography, through the medium of the "PHOTOGRAPHIC NEWS," I beg now to point out to you some difficulties I have met with.

In the positive collodion process, I found the way smooth enough, but I cannot say I have been so lucky in the negative process on glass. I succeeded several times in obtaining good negatives, but as soon as I poured on the fixing solution I was disappointed, obtaining a bad positive instead of a negative. My solutions used were—American collodion excited in a 40 grains neutral bath, and developed with 1½ grains pyrogallic acid, 8 drops glacial acetic acid, 10 alcohol, 5 and 6 drops of nitrate of silver solution, and 1 oz. distilled water, and fixed with hyposulphite of soda.

I tried to take some calotype pictures; used Canson's paper, soaked it on one side in a solution of silver, then iodised in iodide of potassium, and lastly brushed over with a 50 grain aceto-nitrate of silver bath, and gallic acid solution in equal parts; and then what invariably took place was, that the paper began to cover itself with brown patches, and therefore became quite useless.

I have got some collodion which is slow, and gives a rather brown colour to the pictures. I believe the second fault is to be attributed to some bromine that I put in it. Is there anything for these two faults?

Very often I find my pictures dreadfully covered with pinholes. Can that be attributable to the presence of too much iodide of silver? If so, why do I not always meet with this annoyance, which I could not attribute even to an impure bath, as it took place sometimes in spite of a careful filtering?

I hope you will excuse me for having asked so many questions at once, but trust in your kindness to be gratified with a reply, and thanking you in advance,

I remain, sir, yours respectfully,

G. M. F.

[1. We have occasionally met with a similar occurrence, and attribute it to not having developed the picture long enough. We do not know the kind of collodion mentioned, but when there is a large quantity of iodide in it, so that the film is a thick one, the operator is frequently deceived as to the intensity of the negative, the density of the iodide of silver making the picture appear sufficiently developed for a negative, when in reality it is not near dark enough. On pouring on the fixing solution the iodide of silver dissolves away, and leaves the picture in its real half developed state. Try the method of re-development after fixing and *well* washing; it may improve the pictures, but in future develop much further.

2. It is next to impossible to take calotype negatives on French paper: the material with which the paper is sized has a very marked influence on the process, and the starch, which is the sizing material of foreign papers, causes the paper to turn brown on developing. English paper makers employ gelatine, or some similar body, as a size, and that seems to suit the calotype process very well. There is great difficulty in obtaining good paper for this purpose. We prefer Turner's, and but for the spots with which that make of paper is so plentifully supplied it would be perfect.

3. We fear your collodion is useless. Try if adding a few zinc filings will remedy it.

4. *Pin-holes* are a rather common source of annoy-

ance in the collodion process; a frequent cause is dust in the collodion or bath. Too much iodide of silver in the bath may also cause it. The remedy for the latter is the addition of a few ounces of a 30 grain solution of nitrate of silver to the bath. As, however, you say that you only occasionally meet with this fault, and that even after carefully filtering, we are at a loss to divine the cause.]

WORKING WITH A TWIN STEREOSCOPIC CAMERA.—THICK STREAK ON A COLLODION PLATE.—TO ASCERTAIN THE AMOUNT OF SILVER IN THE NITRATE BATH.

SIR,—Can you oblige me, through the medium of your journal, by informing me of the proper method of using a *double* camera so as to obtain the proper stereoscopic effect? a feat which I have hitherto been unable to accomplish. The camera is one with an adjusting screw between the two lenses for the purpose of separating them more fully at pleasure.

Can you at the same time inform me how to obviate, by manipulation or otherwise, the thick *streak* of collodion I invariably get at the bottom of a plate after coating it with collodion? And is there any method of ascertaining the amount of silver in the bath with any degree of certainty?

Feeling sure that your publication is exactly the one wanted by *all*,

Believe me, sir, your sincere well-wisher,

N. E. F.

[1. It must always be borne in mind, that when the two pictures are taken simultaneously on the same plate, the two halves will require to be transposed, that is, the picture which is at present on the right of the plate must become the left picture, and *vice versa*. Most likely N. E. F. has not attended to this rule, and has seen the pictures *pseudoscopic* instead of *stereoscopic*.

2. The fault mentioned can be avoided by using a thinner collodion, pouring on and off quicker, and *rocking* the plate more whilst draining. We cannot explain the manipulation better, but if you watch any good operator you cannot fail to see what we mean.

3. The amount of nitrate of silver present in a solution may be very conveniently ascertained, and that with quite sufficient accuracy for all ordinary purposes in the following manner:—

Prepare a solution of 32 grains of pure chloride of ammonium in 12 ounces of water; 1 drachm of this solution will therefore precipitate 1 grain of nitrate of silver. Measure out very carefully a known quantity of the bath to be tested (2 drachms for instance), place it in a 2 ounce phial, and add a few drops of nitric acid. Now measure out exactly 1 drachm of the solution of chloride of ammonium, and add it, by a few drops at a time, to the silver solution in the bottle, corking it up and shaking violently between each addition, until a white precipitate is no longer produced on the addition of another drop of the test solution. If before this is accomplished, the first drachm of test solution be exhausted, carefully measure out a second drachm, and so on until the desired point is reached. When finished, the number of drachms of test solution used will indicate the number of grains present *in the phial*. Thus, supposing 2 drachms of the nitrate bath had been placed in the phial, and it required 7½ drachms of test solution to precipitate the silver, that would have shown that the two drachms of bath contained 7½ grains of nitrate of silver, or 30 grains to the ounce.

SOAKING THROUGH OF THE BLACK VARNISH FOR POSITIVES.

SIR,—Will you favour me in your next number with an answer to the following question?—Ought a collodion positive on glass to fade after being *well washed* (by a stream from a small glass siphon for a quarter of an hour), varnished with crystal varnish, and then backed by Indian ink, or if such should fade, can you tell me the cause?

My reason for asking the above is, that having taken several of my friends, I have two or three that have gone off all black. The fault cannot lie in the washing, I think; and, as I have a great many that I have taken varnished with spirit varnish, and backed in the same way quite unchanged, I think the fault must lie in the varnish. I ought to say that they have not gone off in the same way that I have seen some from imperfect washing. These go off in small specks and holes in the reduced silver first; but mine have gone gradually, just like dissolving anything in a fluid.

What would you advise as the best backing for glass positives? W. W.

[The cause of the above fault is the black varnish gradually soaking through the film, and thus darkening the picture. We have always found the remedy to be in coating the picture first with a colourless varnish, and then with a black varnish prepared with a solvent that would not dissolve the first coating of clear varnish.

We have adopted the following plan with great success:—pour over the collodion side of the plate, either when wet from the last washing, or when quite dry, perfectly liquid albumen (obtained by beating to a froth, and collecting the liquid after subsidence); after pouring it on and off a few times, put the plate against a wall to dry. When perfectly dry coat with black varnish. For this purpose we employ the *best black japan* used by coach makers, applied thick, and dried in a horizontal position by gentle heat. We have also used printer's ink with great success, and would recommend it to the favourable notice of all those who are in want of a good black backing for positives.]

QUERIES ON LENSES.—LEGALITY OF SUNDAY PHOTOGRAPHY.

Gullane.

MR. EDITOR,—I am glad to see by the newspapers that photographers are likely to have a new and powerful advocate—a worthy exponent of their art! and I am right glad that you intend to give, in the "PHOTOGRAPHIC NEWS," *immediate* answers to your correspondents' questions. I know, and *you* seem to feel, that delay in this matter destroys the interest and advantage of the information.—"*Bis dat, qui cito dat.*"

Will you oblige me by telling me, first, which lens (a landscape lens or a portrait lens) would you recommend me to use for taking views of houses, &c.? Secondly. Is it unlawful to work as a photographer for hire on Sundays?

I am, yours truly,

M. LUGTON.

[1. If intended merely for architectural or similar objects, where the subject is nearly on one plane, a portrait lens may be used with advantage, if you already possess one, as with a moderate aperture (about one half or one third of the full aperture) very excellent and sharp pictures may be obtained in a very short time; but in purchasing one for such a purpose we recommend a landscape lens, as the picture produced is quite as perfect, if not more so, and the price very much less—the only drawback being the increased time necessary to be given during exposure.

2. We do not quite understand your second question. Do you wish us to state whether we think it is a breach of the fourth commandment to work on Sundays, or do you merely wish us to give you the law that bears on the point? As a legal question, there is an act of parliament expressly against working *for hire* on Sundays, although few magistrates care to enforce it. A photographer was summoned before a magistrate some time since for "*following his usual business on Sunday*," and only escaped punishment by proving that he was not carrying on his *usual* business, as he worked as a tailor all the week, and that photography was therefore an *unusual* occupation for him.]

M. GAUMÉ'S PAPER-GLASS.

SIR,—Being anxious to make some paper-glass according to M. Gaumé, I took 3 oz. of the sheet gutta percha, such as surgeons use for splints, and dissolved this in 6 oz. of benzol, that is 50 parts to 100. This solution was of the consistence of ordinary treacle or honey; to this I added 3 oz. more of benzol, thus reducing the gutta percha to 33 parts in 100. This brought it to the consistence of ordinary syrup. Into this fluid placed in a porcelain dish, I plunged a sheet of paper, passing it beneath a glass rod for the purpose of submerging it; the end first introduced was then seized and steadily withdrawn; the fluid as it rolled down the paper, thickened in streaky lines, and the drops which fell from it on the surface of the fluid, so remained, floating white like drops of candle grease. It occurred to me that perhaps M. Gaumé's formula is 4 or 5 parts of gutta percha to the 100, instead of 40 or 50, as stated in your second number. I inclose the result of my proceeding after subsequently exposing it to the heat of the fire. The paper I employed was the thin negative paper.

J. C.

[In repeating the experiments of M. Gaumé (vol i. p. 16), we have found, like our correspondent, that the strength there given is too strong. We have succeeded best when the original solution was diluted with 4 times its bulk of benzol. Our correspondent will also find it advantageous to employ a plate glass cover for the dish, and to draw the sheet between the edges of the dish and cover, so that the excess of solution may be scraped off each side of the paper.]

OBTAINING NEGATIVES WITH POSITIVE COLLODION.

SIR,—Can you inform me of a developing solution that will bring out a good negative upon a plate prepared for a positive picture?

Yours most respectfully,

M. B.

[Of course it will not be so easy to take good negatives with positive collodion as when the collodion is expressly prepared for negatives; but by attending to the following plan our correspondent will be able to produce tolerably good ones. Prepare, expose, and develop the picture as if for a positive, only continue the development longer, until the detail in the shadows is well out, and the picture decidedly overdone for a good positive. Then wash the developing solution well off, and re-develop with the negative pyroxyline developer, adding to it a few drops of the silver bath, as the development seems to require it. The picture will increase in intensity until it becomes a negative, when fix, &c., as usual.]

BISECTING A LENS FOR STEREOSCOPIC PURPOSES.

SIR,—You would oblige by saying, through the medium of the "PHOTOGRAPHIC NEWS," whether it would be possible to cut an *achromatic* lens in *two* so as to form two twin lenses for the stereoscopic camera; and the method of doing it. I fancy both pictures would be equally *exposed*, and equally focussed, thereby producing better pictures, providing development being properly attended to.

M. N.

[There would be no difficulty in cutting an achromatic lens in two, as it is frequently done for astronomical purposes, when lenses worth some hundreds of pounds are thus treated. But it would not be possible to obtain as perfect an image with one of the halves, as with an entire lens; besides which, the "stop" could not be placed at the proper point opposite the centre of the lens. Lenses are now ground *in pairs* for stereoscopic purposes, and thus absolute identity of effect is secured.]

ANSWERS TO MINOR QUERIES.

GOLD-COLOURED STAINS ON ALBUMENISED POSITIVE PRINTS.—CHLORIDES FOR PRINTING ON PLAIN PAPER.—*Tewkesbury* asks the cause of—First, long yellow metallic lines, and circles of the same colour, which are so frequently to be met with on removing the print from the printing frame, and which are still apparent after toning and washing. Canson's, and Papier Rive, are both affected with them, and Tewkesbury hardly ever gets a print faultless in this respect. Secondly, which chlorides are best adapted for preparing plain paper—chloride of ammonium, barium, or sodium?—1. The stains referred to are frequently met with in positives on albumenised paper. A little care in attending to the following points will obviate them. Use quite fresh eggs, and take care that the prepared albumen does not contain any opaque stringy particles suspended in it. The paper must also be lowered on to the surface by means of a steady, continuous movement. Any stoppages in this operation will produce bronzed lines across the paper. Carefully examine the surface of the albumen in the bath after each sheet has been removed from it, and if any scum appears on the surface of the liquid, remove it by drawing a piece of paper gently over the surface, before laying down the next sheet. Be careful also that the quantity of albumen in the bath be sufficient to prevent the sheet from touching the bottom. 2. It matters little what chloride be employed, provided the proportion be such that the bath contains the proper quantity of chlorine. The chemical reaction which takes place between the chloride used in the first preparation of the paper, and the nitrate of silver used in rendering it sensitive, is to produce a *chloride of silver* in the pores of the paper, which is the real photographic agent, and a nitrate of whatever base has been used in the first bath, be it ammonium, barium, or sodium. This nitrate is perfectly soluble in water, and consequently dissolves out into the silver bath whilst the sheet is being made sensitive, and we do not believe it has the slightest direct influence on the result. It may possibly slightly influence the picture in an indirect way, owing to the accumulation of the foreign nitrate in the silver bath, which might thus, in the case of nitrate of soda, for instance, tend to give a deliquescent film on the sensitive paper. Or from the chemical affinities of the base in question,—thus, chloride of barium as a salting bath would tend to convert any sulphates in the paper to the state of sulphate of baryta, which is, as far as present experience shows us, perfectly harmless in a photographic point of view.

RECOVERY OF SILVER FROM OLD NITRATE BATHS.—*W.D.* asks if it is necessary to purify the silver in any way after having recovered it from old baths by means of zinc or copper. When silver is precipitated from a solution of its nitrate by means of zinc, the resulting metallic silver is liable to contain slight traces of the former metal, together with all the impurities with which it may be contaminated. It is a difficult matter for any but an experienced chemist, to separate small traces of zinc from silver, and consequently, we do not recommend this plan

so much as the employment of metallic copper. The copper should be cleaned quite bright when immersed in the bath, and the latter should also be clear and kept well covered during the operation. The action should be allowed to continue for twenty-four hours, and it will be found a material assistance if the vessel containing the mixture be in a warm place. The resulting precipitate, which may be removed from the copper by gentle friction with the finger, must be filtered from the blue solution (nitrate of copper), and washed once or twice with very weak ammonia water, and lastly with pure water, until a drop of the liquid as it comes from the funnel, received upon reddened litmus paper, does not restore the blue colour of it; the precipitate when dry will be pure metallic silver. We recommend the above plan for recovering the silver from old baths, in preference to the method of precipitating it with chloride of sodium, as the *nascent* chloride of silver is liable to carry down with it impurities from the organic matter which has accumulated in the bath.

Substitute for Glass for Collodion Positives.—*E. M.* asks for the best substitute for glass for taking portraits to put into lockets, which will cut to shape after the likeness is taken. Either patent calf leather, or the enamelled iron tablets which have been lately introduced in England. We have seen some very good pictures on these latter.

Varnish for Paper Stereograms.—*J. L.* and *Z.* ask how stereoscopic and other positive prints are varnished. Gum arabic dissolved in water is the most usual glaze for such pictures; but there is also another kind in use, which gives a surface similar to French polish, the preparation of which is, however, kept a secret. (For *J. L.'s* other query, see vol. i. p. 20.)

To Restore the Sensitiveness of Old Collodion.—*T. H. S.* has a quantity of old collodion which has lost its sensitiveness through age, and has become the colour of light port wine. The sensitiveness may be in great measure restored by putting some strips of perfectly clean and pure zinc or cadmium into the bottle, and allowing them to remain in contact, with occasional agitation, until the colour has gone.

TO CORRESPONDENTS.

A Poor Artist.—It will not be difficult to get up sufficient photographic knowledge to be able to produce pictures quite good enough to form the ground work of a painting. In fact, you would be far more likely to paint a correct likeness over a faint out-of-focus print on plain salted paper, provided you have half an hour's sitting to assist you, than if you had relied entirely on the most highly finished photographic portrait. Our remarks did not apply to those who merely intended to use photography as a *means* to an end, but to those who regarded it as *the* end.

Excelsior.—The portrait has been much over printed, and the developing solution poured on the plate too much in one spot, consequently the development has not been uniform. Your toning bath is too old, and out of order now; you had better make a new one. See the article on the subject in a recent number of the "News."

Albert.—See answer to "An Apprentice," vol. i. p. 12. Of your two lenses, the plano-convex lens 7½ inches focus would be better than the biconvex lens of 3 inches focus; the plain side should be turned towards the object to be copied.

R. A.— A white background; it may be made of canvas and coloured afterwards. Rain water is not quite so good as distilled water.

P. H. C.—A separate toning and fixing bath will suit you best.

F. W. H.—Before we can give any advice on the subject, you must favour us with further particulars on the subject of your new discovery.

M. A. H.—A better process has recently appeared in our columns. Albumenised paper may be obtained ready prepared: consult our advertising columns. The toning should be performed in the dark. We do not know any particular material 9 feet wide suitable for a background; we think that there are many of that width.

T. T.—We are obliged by our correspondent's kind note. Orders for former numbers must be given immediately, as they are nearly out of print. It will be nearly impossible to obtain satisfactory copies of anything but engravings by means of gas-light.

J. T.—The details you ask for will be at once found out when you follow the instructions already given.

J. J. L.—Fasten the photograph against a wall in a good light, and place the camera opposite, at such a distance that the image is the desired size on the ground glass.

H. F. T.—We are obliged for the information, but, at the same time, do not think it would answer the purpose sufficiently well to be of interest to our readers.

Amateur.—Fused nitrate, with 2 drops of acetic acid to the ounce of solution. Bromide, chloride, and iodide of cadmium can be sent through the post with safety. You had better use what was recommended, and order the salt from some London house; see advertisements.

R. W. T.—1, and 3. We cannot undertake to say which of the dry processes is "the easiest, most portable, and surest for taking stereoscopic pictures:" so much depends upon the experimentalist's own skill. 2. Yes. 4. The question is hardly a fair one to ask us to answer.

T. Mc.—"has a bath with an excess of both acid and alkali in it," and wishes to know how to remove the excess. This is a chemical impossibility; there can only be an excess of *one*, and cautious addition of the *other* will remove the excess. Is it alkaline or acid? if the former, add acid; if the latter, add alkali.

D. W.—You will not do much good with such a lens. The picture is deficient in half tone; for a remedy see recent numbers.

W. S. P.—Your former letter has been received, and will meet with due attention.

A Manx Amateur.—We cannot give the information clearer than we have already done; the order of manipulation is correct; and the formulæ for solutions are also given. The information was not intended for those who had never attempted anything of the sort before, as they would not be in possession of sufficient experience to be able to profit by it. Chloride of gold will keep in aqueous solution for any time.

C. S. J.—Your collodion is not good; try the formula at vol. i. p. 35. Bicarbonate of potassa will not do for correcting the acidity of the bath so well as carbonate. You received your number of the "Photographic News" without the four inside pages; they contain the articles mentioned in the "Contents." You can at once have the deficiency supplied by mentioning the circumstance to the agent through whom you obtained the "News," or on application to the publishers.

An Amateur.—Salt and chloride of sodium are the same thing; the former is usually applied to the commercial article, and the latter to the pure chemical compound Na. Cl.

J. Thompson.—The "Photographic News" may be obtained direct from the publishers; if you have any difficulty in obtaining it in your village, you would then receive it by the first post on Saturday morning.

A. O.—V. L.—Smith.—Pyro.—X. Y. Z.—A Subscriber.—Our correspondents will see that it is out of our power to save them the trouble which is indispensable in mastering the principles of any science.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—G. G. S. J.—W. H.—F. D. (you had better advertise for negatives).—Young Photo. (5. we do not know the cause of the crack).—T. C. (your bath is perhaps more in fault than the collodion).—A Lover of Photography (daylight is best).—C. E.—B.—Wellwisher.—J. E. F.—W. F. (improved formulæ have been given).—W. R. C.—R. W. H. (1. we think not).—T. C.—R. B.—J. D.—C. O. E.—S. B.—An Amateur (we do not think it can be done).

Communications declined with thanks:—N.—H. C.—O. P. Q.—Subscriber.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 6.—*October* 15, 1858.

ON COPYING PAINTINGS BY MEANS OF PHOTOGRAPHY.

To obtain a true light and shade representation of a painting, must, at present, be considered as one of the unsolved problems in photography. Whether it will ever be satisfactorily solved is, in our minds, a matter of considerable doubt; at all events, we are not at present in possession of sufficient knowledge to see a probable road to such an end. As this is a matter of very great importance, and we think also of some little interest to our readers, we will enter rather fully into the subject.

If our readers refer to our third number, p. 31, a diagram of the phenomena of the solar spectrum will be seen. It is a representation of a ray of light, with the various colours and forces which are therein contained, laid side by side; and thus their properties, not being neutralised or masked, may be examined and studied. The space occupied between (*d*) and (*c*) contains all these various rays, which are constantly being emitted from the sun, and reflected, in more or less quantities, from every object in nature. A reference to the curved line marked *light* in the diagram, will show the fraction of the entire rays which the human eye is capable of appreciating, under the name of *light;* and it is with reference alone to this portion of solar radiation that paintings and other works of art are executed—with the sole object of satisfying the human eye. On referring to the curved line marked *actinism*, it will be seen how widely different would be the sensation caused by any painting, if looked at with a chemical or actinic, rather than an optical eye. The red, orange, and yellow would show no colour whatever, but merely a black mass; the green would be just visible, whilst the dark blue, in the picture, would be exalted in intensity until it equalled the whitest parts. And when, in addition to this, other rays, hitherto unperceived, were seen shining from different parts of the picture in total disregard of the required visible effect—altering tints, and sometimes, as in the case of yellow and blue, entirely reversing the effect intended to be produced by the painter—it will be seen at once, if the pure colours of the solar spectrum can be taken as a fair type of the colours used by painters, how utterly impossible it will be to obtain a correct light and shade rendering of a painting by means of photography as at present known. But fortunately the case is not quite so hopeless as this. There is a great difference between the colours of the sun and those met with in a paint box; the latter, as may be seen by comparing one with a good solar spectrum, consist, in general, of the *desired* colour, largely diluted with other colours in different proportions; and it is on this dilution that the possibility of ever solving the problem depends. If a painting be copied photographically, and the copy compared with the original, it will be seen at once, that every colour on the canvas has produced *some* effect; even the reds and yellows which, according to the diagram, should be absolutely inert, have emitted, along with the dominant colour, sufficient of the actinic rays to produce a very evident effect on the sensitive plate; and it is by fostering this *false* effect, and diminishing in other cases the *true* effect, that we may hope to ultimately attain the desired result.

The first thing necessary to be done is, to employ that sensitive surface which is impressed with the greatest number of luminous rays. Here, on the very threshold, we meet with a formidable difficulty. Iodide of silver, as used in the ordinary photographic processes, is not sensitive to any of the coloured rays of the spectrum which lie between the line marked *indigo*, and the end (*b*) of the diagram; whilst bromide of silver, about which so much has been said in respect to its power of reproducing colours, is equally insensible to all colours below a point opposite the word *green* in the diagram. However, something will be gained by employing the bromide of silver as the sensitive medium instead of iodide, as we thus obtain a mastery over the blue, and part of the green rays; and, as green occurs in almost all the colours used by artists, we by this means gain a great point. Another important step is, to destroy the action of the powerful *actinic* rays (including, in this term, the violet and lavender, as well as the invisible rays). This is not difficult; a thin layer of solution of sulphate of quinine, between parallel glass plates, interposed between the lens and object, will effectually cut off all above the indigo; a thin piece of yellow glass employed in the same way will act even more vigorously, and, were it not for the uneven surface which this kind of glass usually has, it would answer the purpose admirably.

By employing the information above given, it will be possible to obtain far more correct copies of paintings than are usually to be met with. The collodion should not be iodised, but *bromised*, with four grains of bromide of cadmium to an ounce of plain collodion; and the lens, which must have a sheet of yellow glass close in front of it, should be a portrait combination, working with the full aperture, as the time of exposure to the feeble rays, which alone can filter through the yellow glass, will be enormously prolonged, even when the picture is illuminated as perfectly as possible. The plate should be slightly *over*-exposed, so as to diminish still further the unavoidable exaggeration of the lighter parts of the painting, and, at the same time, bring out the detail in the dark parts. We are of opinion, that better results may be obtained by increasing the number of thicknesses of yellow glass in front of the lens. An experiment of our own will show, how far this modifies the usual photographic action:—A strip of card was painted with several brilliant colours, and then a photograph was taken of it, with iodised collodion, in the ordinary way. It came out, as might be expected, with the photographic order of intensity totally unlike the *visible* gradation of intensity. Bromised collodion was now used, and the result was much better; one thickness of yellow glass was then interposed, and the effect, whilst it

increased the time of exposure from seconds to minutes, gave a very marked improvement in the truthfulness of the picture. A second piece of yellow glass was afterwards used, which had the effect of still further increasing the resemblance to the light-and-shade effect of the original colours; and thus we went on, at each addition of yellow glass obtaining a slightly truer translation of the colours into light and shade, but at an enormous sacrifice of time, until, at last, the plate would not bear the necessary exposure; and, at five thicknesses, we were obliged to desist. At this stage, the photographic effect of the different colours was much nearer their true effect on the retina than if they had been copied in the ordinary way; but they were still very far from giving the tones which an engraving of the same subject would have presented. The too energetic action of the blue colour was entirely overcome, but the red and yellow still offered difficulties which, we fear, no amount of obstruction would ever have properly overcome. The subject, however, is one which, from its importance, deserves more, far more attention, than has yet been paid to it; and we have dwelt thus long upon it, in the hopes that we may induce some experiment-loving amateur to take the subject up *con amore*, and assist further in elucidating this most difficult application of the science of photography.

PHOTOGRAPHY AT CHERBOURG.

Among the multitude of visitors, foreigners, tourists, artists, and writers who crowded to Cherbourg during the fêtes, there were, as might have been expected, a goodly number of photographers. Wherever anything was to be seen, there we were sure to find a camera planted, and sometimes several. Such opportunities as were offered on this occasion are rare. It was not to be supposed that photography could be behind-hand in recording the magnificent spectacle offered by the combined fleets at anchor beneath the admiring gaze of an enthusiastic multitude assembled from all parts of Europe, in perpetuating the remembrance of the great events of the epoch. The French administration, foreseeing and appreciating the importance of the services the art was capable of rendering, had officially charged M. Baldus, the photographer of the new Louvre, to take different views of the anchorage and the fleets. The mission was honourable but difficult. In fact, they were sea-pieces, and not simple reproductions, that were required; and, of course, this rendered necessary the employment of processes the rapidity of which would allow figures to be seized while in motion: happily the artist chosen for this task cares little for difficulties, as the proofs he has brought back amply show. Conformably with the instructions which were given to him, M. Baldus chose a point of view from whence the object glass could take in the whole of the anchorage; the ground of all the pictures is the same, the sky above, the sea below, the bold outline of the breakwater forming the horizon, the rocks bathed by the waves forming the foreground. But the subject varies according to the evolutions of the fleets. The size of the pictures is such that the artist has reproduced every detail with a precision which allows the recognition of the humblest boat in this animated and floating crowd. The masts crowd together, the sails are loosened, the bowsprits cross each other, the flags mingle, and yet there is no confusion, all is as precise in the picture as it was in reality.

M. Moulin, to whom a kind recommendation of the Minister of Marine assured access and protection wherever he presented himself, was thus enabled to compose an album into which the illustrated papers have dipped deeply for their most interesting pictures. The twenty-four proofs of which this album consists represent the principal episodes of the fêtes, and are very remarkable for their execution. They are full of light and movement. Those obtained during the filling of the basin named, after the Emperor Napoleon III., and the launch of the *Ville de Nantes*, are especially of a most striking appearance on account of the animation of the spectacle they represent. The clearness of the design is such that one can distinguish dresses and uniforms in the crowd, and the attitudes of the greater part of those present. It is extremely curious to pass in review, with the aid of a magnifying glass, the microscopic groups which seem to move under the gaze. The views taken of the anchorage are not less striking. If it is difficult to seize a crowd in motion, it is not less so to reproduce a squadron in the act of saluting its august visitors with broadsides. This difficulty M. Moulin has overcome with a success which does honour to his ability.

Another artist, M. Furne, junior, already known by previous works, has taken a numerous series of stereoscopic views of Cherbourg, the subjects of many of them trivial enough, but still not without interest. M. Richebourg also took many similar views; among others, a view of the arrival of the imperial party at the railway station; the Bishop of Coutances pronouncing the discourse at the reception of the Emperor, &c. A singular circumstance occurs in these pictures—each of them records the moment when the scene represented took place, inasmuch as it reproduces the station clock, by which we are enabled to see that the Emperor arrived precisely at five o'clock, the prelate pronounced the receptional discourse at five minutes after five, and at a quarter past five the engines were blessed. We think it is scarcely necessary to point out the importance of such precision in certain cases.

QUESTIONABLE SUBJECTS FOR PHOTOGRAPHY.

"Alas, poor Yorick!"
"To what base uses we may return!"

We were recently attracted by an advertisement to the following effect:—"Extraordinary stereoscopic novelty! 'The Skeletons' Carouse!!'"

The feeling we experienced on the perusal of the above was something like that which a man feels on reading the play-bill of one of our transpontine theatres, which seem, as a general rule, to flourish on a class of play that has more or less of the mysterious or horrible in its composition. We are all acquainted with those large poster announcements which inform the reader that a certain play is received with nightly applause; and the advertisement of "The Skeletons' Carouse" can excite but one feeling—that of curiosity, to see how the subject would be treated, and whether the fact would bear out the strong adjective which informed us that it was "extraordinary." As we are particularly desirous of seeing and knowing all that transpires in the photographic world, whether it be useful or ridiculous, we followed the directions of the advertisement, and forwarded twenty-four postage stamps to the depôt, for which we received a slide which is, in reality, an "extraordinary novelty!" It is a picture of six *human* skeletons, in all their ghastly reality, seated round a table, on which are placed all the necessary accessories of pothouse paraphanalia. At the head of the table sits one of the figures, with a presidential air, while the rest are posed as if in the act of conversing. On the

floor is a spittoon and a lantern; the former, no doubt, being requisite, as the whole of this ghostly crew are supplied with cigars and pipes! We certainly must give credit to the arranger of this group, who has placed the figures in very natural attitudes. The *tout ensemble* appears very much like a madcap freak on the part of some medical students, who, we are led to suppose, are anything but reverent to what ought to be considered most sacred—the human body after death. We cannot find words strong enough to express our disapprobation of the publication of this slide. There is something about the whole affair so flippantly sacrilegious, that it cannot fail to disgust any right-thinking person. It is well-known that, even when science demands that a body should be subject to medical examination, there is always a strong feeling against such a proposal; and it is often only by urgent representations that the relatives of deceased persons can be induced to allow the bodies of their dead friends to be thus mutilated. But what must we say of this gross violation of all the laws of decency and propriety? Were not all these six skeletons at one time living men, who moved and breathed, and took part in the duties of life as we do now? and though they may, many a time, have repeated the words of Shakespeare,

> "Imperious Cæsar, dead and turned to clay,
> Might stop a hole to keep the wind away.
> Oh that that earth, which kept the world in awe,
> Should patch a wall, to expel the winter's flaw!"

yet it is certain that it could never have occurred to them that at some future day their skeletons should be made the subject of a jest in a stereoscopic slide! What meaning there is in the idea of this picture we are unable to understand: we are not aware that, even in the extravagant class of plays to which we have alluded, there is any drama which furnished the groundwork of this picture; and, certainly, there is no sense in the idea. It is, to our minds, the result of a wanton profanity, which would turn into ridicule what ought to be held in religious veneration. We think that a sense of propriety will at once forbid any more traffic in this disgraceful attempt to travestie the most important aids of anatomical science; and we are at a loss to conceive how people can have so far forgotten their own self-respect as to encourage the sale of such a disgusting picture, unless they buy it—in the blind ignorance we did—simply to satisfy curiosity. There is not a single argument that can be put forth in palliation of this shameless irreverence. The fair way in which to put the matter is,—to ask ourselves if we should feel comfortable at the idea of being thus made the jest of the silly and weak-minded. If there was a scarcity of subjects, there might be an excuse, which cannot now be adduced; and if the argument is that novelty is wanted, all we can say is, that however great the demand for new pictures, that never can be argued as a plea for the extravagant and unwarrantable liberty taken by the composer of this revolting subject. If such a subject is not everywhere repudiated as an insult to popular taste, we blush for the art taste of our countrymen.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

PART II.

Mr. R. J. Fowler next read a paper on "a process for the estimation of actinism." He said:—

"That in drawing the attention of the section to the estimation of the actinic force of the solar radiations, his object was, rather to add what he presumed were new facts to the science of actinometry, than to present a perfect and complete process in every respect. In the ninth volume of "Gmelin's Handbook of Chemistry," he found it stated, that oxalate of ammonia mixed with aqueous proto-chloride of mercury is decomposed under the influence of light—yielding sal-ammoniac, calomel, and carbonic acid. It also stated, that the mixture of the two solutions remains clear in the dark; in daylight it becomes turbid in six minutes, and, in course of an hour, deposits calomel, which, in sunshine, quickly falls down in soft flakes, surrounded with bubbles of carbonic acid. The filtrate no longer contains mercury, but chloride of ammonium and undecomposed oxalate of ammonia. On seeing this, he was at once struck with the idea, that here might be the elements of a process for actinometry; and, whether this was the fact, he left them to judge from the experiments he had tried on the subject. He found it true that the solutions named might be kept unchanged for an indefinite period in the dark; that the calomel began to precipitate in from fifteen to twenty seconds in full sunshine; and also, that the precipitation ceased immediately the vessel containing the solution was removed from solar influence; thus showing, that the action is not continued in darkness, even when the change has been partially effected, and that the action of the actinism is not, in this case, catalytic. He had also exposed three tubes, containing the mixed solutions, to pretty uniform light; No. 1, for ten minutes; No. 2, twenty minutes; No. 3, forty minutes—the result being, that No. 2 contained twice the bulk of precipitate of No. 1, and No. 3 twice the bulk of No. 2. When the solutions were exposed several hours, the vessel containing them was found to be completely filled with a magma of the precipitated calomel. From the experiments, it appears conclusive, that the mixture of solutions of oxalate of ammonia and proto-chloride of mercury, is very sensitive to light; and, as this action of light is not catalytic, the precipitate obtained may be considered as produced by solar influence alone; and, lastly, that a definite amount of precipitate is produced by a definite amount of actinic force; thus proving, that there are elements of certainty and uniformity in the behaviour of mixed solutions when exposed to solar influence, from which a certain method for estimating the actinic force may be formed. If extreme delicacy were required in the estimation, the precipitate might be collected, dried, and weighed; but where this was unnecessary, graduated tubes might be used for exposing the mixed solutions, and from which, after standing a certain time in the dark, the amount could at once be read off. Mr. Fowler stated that, in his experiments, he had used a nearly saturated solution of the two salts; but this was by no means necessary, as he found that, if a drop of the solution of proto-chloride of mercury, containing only 1-1500th part of a grain of that salt, were added to 300 grains of the solution of oxalate of ammonia, and exposed to the light, the calomel would still be precipitated. The reaction, in fact, being so delicate, that it might be used for a confirmatory test for the presence of proto-chloride of mercury. He states, in conclusion, that it would be interesting to know, how the absorbed actinism of M. Niépce de St. Victor would affect the solutions. He had made some experiments in that direction, but not with sufficient success to warrant any positive assertion."

At the close of Mr. Fowler's paper, Mr. Mercer, F.R.S., exhibited several specimens of chromatic photographs; some being on calico, or a similar fabric, produced by previously soaking the material employed in a solution of pre-oxalate of iron, the effects produced were both singular and novel, and the method promises to lead to photographic colour printing.

Mr. W. S. Warr said, the thanks of the section were due to Mr. Mercer for his experiments; and, in reference to Mr. Ward's paper, remarked, that he could not agree altogether with its author as to the artistic difficulties. To secure the full effect of foliage and water, much exposure was absolutely necessary. The great practical difficulty was to hit the right point between under and over exposure, as the effect of light was more powerful at first than afterwards.

Mr. Smith said, that he believed the simpler the manipulation and material the better. He thought the dry processes a complete failure.

PHOTOGRAPHY IN ALGERIA.

NO. II.

My dear Sir,—For some days after the despatch of my last letter, I employed myself in taking photographs of buildings and other objects to be found in the streets of Algiers. I at first thought that I might be interrupted in my operations by the curiosity of the natives, but I soon found that my proceedings excited very little attention. Whether this indifference on the part of the Arabs is affected or real I cannot say, but certainly one would fancy them to be as familiar with the sight of the camera as they are with the appearance of the parasitic insect addressed by Burns on the occasion of its crawling over a lady's bonnet at church. They pass along without paying the least apparent attention

to my operations; and if I happen to direct the lens towards a body of them, they are not in the slightest degree discomposed, and I have thus been able to obtain pictures free from the stiffness generally apparent in the photographs of groups of individuals where the figures appear to have been arranged for the purpose. These Arabs are perfect as models. I have seen six or seven of them seat themselves on the floor of a coffee-room, and, after lighting their pipes, remain silent and motionless for half an hour at a time. This silence, I imagine, arises quite as much from a want of ideas as from any other cause; in fact, having nothing to say, they don't say it; but start an Arab on the subject of his shooting, or his horse, and he will deliver himself of an oration, containing as many superlatives as an article in a Neapolitan newspaper on his majesty King Bomba, with an energy and gesticulation that would induce a bystander to imagine him to be labouring under an access of fury, and with an amount of figurative boasting that leaves a Yankee far behind. I have myself heard an Arab make a boast, with respect to his horse, which was quite as extravagant as that of the American, who said he had raced his horse against a flash of lightning, and beaten it by three seconds. I believe it to be this want of subjects of conversation which makes the Arabs so fond of listening to the professional storyteller, which they do with a profound attention which many of the tales are far from deserving, if I may judge from the translations that have been made to me; some of them, however, are of a more interesting character. I had sent my camera, &c., to a café in the western suburb of the town, the entrance to which was from a narrow street, being formed by a row of pillars, which allowed a full view of the garden and the summer-house supported on piles over the little river that ran through it. On the ground, in groups of four or more individuals, were seated numerous Arabs, among whom were many spahis, whose uniforms gave a variety to the picturesque scene, which made me wish that photography could reproduce colours as faithfully as objects. I may here mention, *en passant*, that I have been using the uranium printing process, about which so much was said at Paris at the time Nièpce de St. Victor first suggested its use, though, as you know, it was used before then in your laboratory. When I was in Paris, just previous to coming here, I heard such glowing accounts of what had been done by its means, that, as their manipulations were in some points different from yours, I made a note of them, and I have since being here made some experiments, which have induced me to modify the process as described by them, and with exceedingly good results. After preparing the paper with gelatine and nitrate of uranium in the usual way, and exposing it to the light, I develop by means of the aceto-nitrate of silver bath, such as is used for paper negatives; and on removing it from this bath I plunge it into a bath composed of 100 parts of water, 9 of proto-sulphate of iron, and 3 of acetic acid. I have obtained proofs in this way equal for depth and vigour to any I ever saw. I need not tell you that there is no truth in the assertion that pictures printed with uranium are unassailable (which I was repeatedly assured in Paris was the case); but still I think, until we hit upon some carbon process, we shall find no substance which will give such durable pictures as nitrate of uranium.

After I had taken three or four negatives, I sent my man with the apparatus to the hotel where I was staying, and then went into the summer-house and called for coffee. There were about twenty Arabs seated there in a circle, listening to one of these storytellers; and, as several of them had taken their pipes from their mouths and had ceased smoking, I concluded that the narrative was of unusual interest, and I was soon convinced of this by the excitement they displayed as the story drew near its *dénouement*. After the *raconteur* had finished, and "sent round the hat," I beckoned to him, and desired him to sit down, and relate the story in French for my benefit. It was, in substance, as follows, and, as he assured me, strictly true, and of recent occurrence:—A young Arab, named Ishmael, became acquainted with a girl belonging to a tribe at enmity with his own, and a strong attachment sprang up between them. Eventually the girl agreed to leave her father's house, and to fly with her lover to the douar he inhabited at no great distance, but which was situated on the opposite side of the mountain. She left her home a little before sunset, and joined Ishmael, who, too poor to possess a horse, was to conduct her over the mountain on foot. The path was through a wood, and they were well aware that a lion was accustomed to reside there for months at a time; but, as was the case with the "ladye-love" of Sir Richard of Coldinghame, so with them—"love conquered fear;" and they had crossed the mountain, and were actually in sight of the friendly douar, when, right before them, in the middle of the path, lay an enormous lion. They stood petrified with fear, gazing at the beast, who appeared not to notice them at first, but after about a minute he rose and moved towards them. The girl uttered the most piercing shrieks, which were heard at the douar, the inhabitants of which armed themselves, and proceeded in the direction of the group formed by the lion, Ishmael, and his bride. At the moment they came within gunshot, the lion was leading the man, who appeared to be under the influence of a species of fascination, into a thicker part of the wood. His arm was round the waist of his betrothed, who seemed to struggle to free herself from his hold, but in vain, and the Arabs saw at once, that if they were to save the unfortunate couple no time was to be lost. Accordingly they all fired at the lion at once, and the beast was probably wounded, for he sprang upon Ishmael, placed a paw upon each shoulder, took his head in his mouth, and crushed it, and then, without tearing the body, dropped it to the ground. The girl had sunk to the earth in an almost insensible state; and when the Arabs, who had fled immediately they had discharged their guns, again came near the spot, they saw her sitting on the ground, and the lion lying down with his head resting on her knees. To fire at the animal in the position in which he was, was almost certain death to the girl; but a moment's reflection convinced them that it offered the only chance of saving her. They accordingly fired; and, before the smoke had cleared away, the lion was in the midst of them. He struck one dead with a blow of his paw, crushed the head of another in his mouth, and pursued and caught a third, whom

he lacerated in a frightful manner, and then returned to the girl. Of course, after this, no further attempt was made to rescue her; and how long she may have remained in this valley of the shadow of death before the beast released her from her agony, cannot even be guessed at; but when daylight dawned and the Arabs came to seek the bodies of their friends to bury them, all that remained of her was no more than was left of Jezebel whom the dogs devoured in Jezreel.

The professional storyteller, among the Arabs, is a man of no inconsiderable talent. He is a good actor, suits his gesticulation to his subject, has great command of voice, and, in narratives like the above, absorbs the entire attention of his audience; consequently, like the minstrels of old in our country, he is well received wherever he may go, that is, among the Arabs, who are not repelled by the extraneous vitality which circulates about him. With Frenchmen the case is different; for though they are not over-fastidious with respect to their ablutions, they are not to be compared to the Arabs, who regard soap as superfluous as hair-curling fluid to a nigger, or crinoline to a Hottentot Venus.

I have not been here long enough yet to say authoritatively that there is little love between the French and the natives; but, as far as I have been able to judge, the Arabs regard their conquerors with great dislike and some fear, and with profound contempt as individuals. The latter feeling arises in part from the arrogance inspired by their religion, which induces them to look upon professing Christians as little better than dogs, but principally from the vivacious character of the Frenchmen, whom they see dancing and otherwise conducting themselves in a manner which they regard as unmanly. Of course, you have heard and read, what has been so often asserted that it appears to be generally admitted as a fact, that Frenchmen have a peculiar talent for insinuating themselves into the affections of uncivilised people, which Englishmen do not possess. I don't believe a word of it. It may be true in the case of French sailors, when they are

"All among the Hottentots,
Capering on shore,"

but does not apply when Frenchmen are permanently resident among a less barbarous people, especially if that people is composed of Mohammedans, who, though they may despise the Englishman's religion, yet cannot but feel a certain degree of respect for the calm and serious man himself.

In my last letter, I mentioned that I had been partially successful in obtaining certain photographs of the execution of the murderers of poor Gilson and his family. I am sorry to tell you that my success is not so great as I imagined. The third and fourth pictures have faded quite away, and the second so much as to be entirely useless; the first alone retains its distinctness. I am quite unable to explain the cause. I am convinced, however, that it arose from no fault in the manipulation, and of the goodness of the collodion I have since had ample proof; consequently I can only attribute it to the atmosphere around the scaffold being affected in some such way as that suggested in my last letter. A similar occurrence once happened to me in the course of a tour in the south of France. I had selected a view, and fixed my camera in the expectation that I was about to obtain a photograph of a pretty little cottage in the midst of a vineyard; but, on withdrawing the slide, I found nothing but a bleared and indistinct appearance of the object. I at first imagined that the pose had been too short, and made a second attempt, which was likewise a failure. I persevered; but, notwithstanding the adage to the contrary, my perseverance was *not* rewarded. I next looked about for the cause of such an effect, and eventually I found, that a building at no great distance was an animal charcoal factory, and I could only impute my failure to the supposition that the atmosphere was, to a certain extent, charged with the vapours arising from this factory. To test this, I determined to visit the spot at daybreak the following morning, and make a renewed attempt. There had been a pretty brisk breeze all night, which died away directly after I had planted my camera to the windward side of the factory, and I obtained excellent views; yet, when I tried again in the course of the afternoon, I failed as before, thus proving, beyond all reasonable doubt, that my supposition was correct.

I have become acquainted with a sheikh who owns an extensive douar near Constantine, and I have partly promised to go with him when he leaves here, and spend a few days in his tents, which will give me an opportunity of getting some interesting pictures for the stereoscope. He is a bit of a bore sometimes, especially when he gets on the subject of his horse, of which, though it is not much to look at, he tells me wonders, more particularly with respect to its pedigree, which, according to his showing, must date back almost as far as that of the Welshman, who exhibited, about half way down the parchment on which his genealogy was written, a note in the margin:—"*About this time the world was created.*" Excepting this, and a weakness in favour of Frenchwomen, rather unworthy of an Arab and a sheikh, he seems a very estimable man. I have not received any copy of your "NEWS" yet, and as I propose leaving here next week, I am afraid I shall not see it until I return.—Yours truly,

C. A.

P.S.—In the event of your publishing the above letter, pray omit professional details as much as possible. I prefer rather to amuse than to bore your readers with contrivances, which, if they appear to me ingenious, would no doubt suggest themselves to any photographer similarly circumstanced.

Critical Notices.

REVIEWS OF BOOKS.

The Ambrotype Manual. A Practical Treatise on the Art of Producing Collodion Positives. Principally selected from the works of C. A. SEELY, A.M., Editor of the "American Journal of Photography." First English Edition. Liverpool: J. Atkinson.

THIS pamphlet, as its title informs us, is a reprint of an American work, written by the editor of one of the American photographic journals. The go-ahead style of writing which more or less characterises all Transatlantic effusions is carried out here to the usual extent. We have seen a few numbers of the journal which Mr. Seely conducts, and have certainly been amused at the free-and-easy style in which matters are treated. There is that smartness—to use an

expressive term—which characterises the style of a few of our London writers for the Press—a style in which there is sometimes an evident striving after effect—even at the expense of perspicuity. In periodical literature there is an excuse for this, and in the present day it is more or less expected. But when a writer presents his ideas to the reading world in a pamphlet form, it is generally expected that his thoughts have been matured, and that its style should not be too strongly marked by that flippancy which is pardonable in serial writing. To illustrate the manner in which the writer treats his subject, we cannot do better than extract the laconic paragraph which is entitled the Preface, in which he says: "The writer of this little book has done his work without ambition or concern. The art of Ambrotyping seems to him a simple thing, and he aimed only to tell the story plainly. Moreover, there is enough demand to sell the work and satisfy the publisher—the main point."

There seems a slight discrepancy between the first sentence, in which there is a disavowal of "ambition or concern," and the last, which says that the "main point" in publishing the work "is to satisfy the publisher," who, by-the-bye, in America, is Mr. Seely himself!

We are always glad to see any addition to our photographic literature, especially anything which simplifies the art as this work does—to the American reader. While we are grateful to Mr. Atkinson in giving us a reprint of this work, we cannot help thinking that if he had translated it into English, or even the equivalent slang of this country, it would have added much more to the value of the work; for it must be remembered that, interested and amused as we are at the eccentric phraseology used now and then by American writers, we are by no means well versed in the capacious vocabulary of Yankee slang. We do not write this in any hypercritical spirit; on the contrary, we rather enjoy the manner in which photography is "made easy" by the writer. But we think that the few hints suggested above might be the means of increasing the value and usefulness of the work.

In the chapter headed "Advice to the Beginner," there are the following racy directions for cleaning the plate:—"The work is easy enough, yet judgment and skill are necessary. For the lack of these I have seen much time and manly strength wasted. A booby goes at a plate with fierce rubbing, scouring, and scratching, bearing on as if dirt was to be squeezed out, punishing the innocent glass dreadfully;—beginning with a dirty plate, leaves it in the same condition." There is certainly a great deal of truth in the foregoing, and it is put in a manner which we conceive is adapted to the comprehension of the dullest intellect. His laconic advice in regard to pouring collodion on the plate is very appropriate. Speaking of the particles which invariably produce blemishes, he advises the operator to make it a rule to wipe the mouth of the bottle before pouring, "and always obey it." In regard to photographic chemicals, he gives some excellent advice, which we sincerely recommend to the readers of the "Photographic News." He says that if "any one who has a proper interest in the art will pursue the subject beyond this little work, let them read a *Photographic Journal and study chemistry*." Let our readers do the former, and in our articles on "Photographic Chemistry" we think we can materially assist them in the latter. The writer denounces in rather vigorous terms the various nostrums which have been put forth for making "white varnish," and which he expressively sums up in one word, "Humbug." On the subject of gun cotton he is witty, and thinks that the attempt to make it "furnishes an excellent opportunity to ruin a suit of clothes, weaken a pair of lungs, and to get a mass of stuff that can't possibly make a good picture;" and possibly by a slight mishap, such as breathing the vapour evolved during the preparation, it "will insure you a speedy passage to the spirit-land." The foregoing will give our readers a good idea of the jocular style in which the work is written. Even for the non-photographic reader a vein of humour runs through the whole of the book which would make it readable, although the chemical and photographical allusions were totally unintelligible. The great fault of the work is, that it deviates from the law which governs, or ought to govern, all scientific compositions, viz., that in every language there should, if possible, be an uniformity of terms; because nothing can be more difficult to the reader than to find a number of new terms introduced into the work, the meaning of which he has either to guess or remain in ignorance of. For instance, why entitle the process "Ambrotype," when in this country it is known as the "glass positive" process? What is the meaning of a "camera shield" or a "plate vise"? We have not space to detail the number of terms, which we are sure will puzzle many English readers. To American writers on photography we would give one word of advice, and that is, "Use the same terms in America as are used in the mother country," because we are sure that the claim which a 'cute Yankee once made, that English was *first* spoken and is now *best* spoken on the other side of the Atlantic, will not be conceded. To those enterprising photographers who wish to excel in Ambrotyping, Balsam sealing, Crayon Ambrotyping, Melianotyping, Sphereotyping, Mirror Ambrotyping, Neillographing (!), Pearl Ambrotyping, Imperial Ambrotyping, Relievo Ambrotyping, and Double Figuring (!!) we heartily recommend this work.

Photographic Chemistry.

NATURE OF THE METALS.

We shall now proceed to consider the nature of the metals, upon which we propose making a few general observations. To a common observer it might appear that all metals are substantially the same, and that the different appearances they present might arise from the accidental presence of some colouring matter. This was the opinion actually entertained by the alchemists of former days, who believed that gold was the basis of all metals, and their efforts were consequently directed to eliminating from a mass of lead or other base metal that which prevented it from appearing in its primitive condition. This opinion, it is needless to say, is not shared by the chemists of the present day, who, considering the different degrees of hardness, strength, brittleness, &c., possessed by the metals, believe them to be of different natures. They have, however, certain qualities in common, metallic lustre, density, hardness, opacity, tenacity, ductility, malleability, fusibility, and as conductors of heat and electricity they differ only in degree.

By *metallic lustre* is meant the property possessed by metals, when polished or freshly cut, of reflecting light. *Opacity* is the property which these bodies possess of interrupting the passage of light; except when beaten out into a leaf of extreme thinness, when they become translucid.

By *density* is understood the weight compared with the volume. All metals, with the exception of sodium or potassium, are heavier than water, the heaviest of all being platinum; their respective densities may be classed as under:—

A volume of water weighing	...	...	1·00
The same volume of platinum will weigh		...	22·69
" of gold	"	...	19·25
" of mercury	"	...	13·54
" of lead	"	...	11·35
" of silver	"	...	10·47
" of copper	"	...	8·87
" of iron	"	...	7·78
" of zinc	"	...	6·86
" of aluminum	"	...	2·56
" of sodium	"	...	0·97
" of potassium	"	...	0·86

Metals differ in *hardness*—the two extreme examples being iron and lead. They are *ductile*, that is to say, they may be drawn out into threads; their ductility ranks as follows:—Gold, silver, platinum, iron, copper, zinc, tin, lead. They are also *malleable*, that is, they may be beaten out into

sheets of greater or less thinness, according to the degree in which they possess this quality; they may in this respect be classed as follows:—Gold, silver, copper, tin, platinum, lead, zinc, iron. Platinum and gold are so extremely malleable and ductile that the former may be drawn out into wire so fine as to be almost invisible to the eye, while the latter may be beaten into leaves so thin that 50 square inches will not exceed one grain in weight. As conductors of heat the metals stand in the same order as with respect to ductility, but as conductors of electricity their position is somewhat different. First in order comes copper, then gold, silver, zinc, platinum, iron, tin, lead. The heat at which metals melt varies in degree; thus platinum and some others are infusible in a furnace, tin melts at 250 degrees, and mercury is a liquid at the ordinary temperature of the atmosphere.

All metals combine with oxygen to form metallic oxides; and, owing to their varying affinities for oxygen, they have been divided into six sections or classes. In the first are included potassium, sodium, lithium, barium, strontium, and calcium. The affinity of these metals for oxygen is such that they decompose water at ordinary temperatures. In the second section are included metals which decompose water at a temperature under red-heat; these are aluminium, magnesium, zirconium, yttrium, manganese, and some others of less importance, which are little used in the natural state or in combination with other substances. In the third section are included those metals which decompose water only when they are at a red-heat, or at ordinary temperatures when under the influence of acids; these are iron, nickel, cobalt, zinc, cadmium, chromium, vanadium, and uranium. In the fourth section are classed tungsten, molybdenum, osmium, tantalum, titanium, tin, and antimony; all these metals possess the first property of those of section three, but not the second. The metals of the fifth section—bismuth, lead, and copper—decompose water only at exceedingly high temperatures.

The metals included in the preceding sections can unite directly with oxygen; and some of them even at ordinary temperatures; moreover, their oxides are not decomposable by heat alone. The metals included in the sixth section differ from the others in that they do not decompose water, and their oxides can only be decomposed by the action of heat, under the influence of which the oxygen is given off, and the metal alone remains. They are platinum, gold, silver, rhodium, mercury, iridium, palladium, and ruthenium.

There is another method of classifying metals which is more simple than the above: this consists in dividing them into alkaline metals, the oxides of which form powerful alkalies, like potassium, sodium, &c.; earthy-alkaline metals, like calcium, barium, and strontium, which usually enter into the composition of earths and stones, the oxides of which also possess an energetic alkaline reaction; earthy metals, such as magnesium, the oxides of which have little or no alkaline reaction; and, finally, in *metals properly so called*, which are those most commonly known as such. We have adopted the former method as being clearer and more precise.

(*To be continued.*)

Dictionary of Photography.

Acetic Acid (*continued*).—*Glacial acetic acid* is prepared, 1st, by distilling an intimate mixture of 1 part oil of vitriol with 2 parts of dry pulverised acetate of potassa, or lime, or with ¾ part of acetate of soda, or 3 parts acetate of lead. Whichever acetate is used, it must be dried by exposure to a gradually increasing heat, and stirred all the while, and the oil of vitriol must be previously freed from excess of water by boiling.

2nd. By distilling acetate of potassa alone. When an excess of moderately strong acetic acid is mixed with acetate of potassa, and heated, part of the acid unites with the acetate of potassa, forming biacetate; if, after having driven off the excess of acetic acid by heat, the dry biacetate of potassa be introduced into a retort, and heated to a temperature below 300°, glacial acetic acid will be evolved, which, by rectification, will be obtained quite pure. The residue in the retort will be acetate of potassa, which will serve for repeated operations.

3rd. By distilling neutral acetate of copper. The distillate must be purified by rectification from water and copper, which is mechanically carried over.

Glacial acetic acid may contain, as impurities, *sulphurous acid*, *sulphuric acid*, *hydrochloric acid*, *nitric acid*, *acetate of potassa*, *soda*, *lime*, or *lead*. These may be removed by digesting it for some time with finely pounded dry acetate of lead, and then redistilling it. It may also contain *acetone* and *empyreumatic oil*, produced by over heat during distillation. These may be removed by freezing, and separating the solid portion, which will be pure acetic acid, from the liquid portion, which will contain the above impurities. Lastly, the glacial acid may contain an excess of water: this can be told by the acid not entirely solidifying at a low temperature; it may be removed by distillation from excess of dry charcoal powder; the water will come over first, and, lastly, the glacial acetic acid.

To detect injurious impurities in acetic acid, dilute the glacial acid with its own bulk of water, and dissolve a crystal of nitrate of silver in it (about two grains to a drachm); if no white precipitate be formed, the absence of *sulphurous* and *hydrochloric acids* may be inferred. Now expose the mixture to sunlight for half an hour; if at the end of that time there is no discoloration or precipitate, acetone or empyreumatic oils are absent. The presence of sulphuric acid will be told by the production of a white precipitate, on adding a drop of a solution of chloride of barium to the diluted acid. The presence of an acetate may be known by the acid leaving a solid non-volatile residue, when evaporated to dryness on a clean surface of glass or china.

Pure glacial acetic acid becomes solid at about 15°, but when solid, does not liquefy until a considerably higher temperature is reached. It has a pungent, sour taste and smell, and acts as an acrid poison. If heated to its boiling point, the vapour is capable of burning with a very dull blue flame. It absorbs moisture from the air; but, when mixed with water, does not evolve much heat. It is capable of precipitating many salts from their aqueous solutions, by abstracting the water. In its most concentrated form it dissolves dry carbonate of lime, potassia, soda, magnesia, &c., either slowly, or not at all; although, when diluted with water, it acts upon them in the most energetic manner, dissolving them, and forming acetates. For photographic purposes *Beaufoy's* acid is frequently used; this is cheaper, and may be met with at most druggists where the glacial acid would be difficult to obtain. It is more liable to be contaminated with impurities than the glacial acid, and should be submitted to the tests given above before using. It contains 30 parts of glacial acid, and 70 parts of water.

Acetic acid, either glacial or otherwise, is employed

largely in all photographic operations. In the negative paper processes acetic acid is added to the solution of nitrate of silver with great advantage. When the paper is first impregnated with iodide of potassium, and, when dry, floated on a solution of nitrate of silver, acetic acid is added to this latter solution. It probably assists in the decomposition of the iodide present, both by reason of its superior strength to hydriodic acid, and also by penetrating the paper more rapidly than a pure aqueous solution would do; a property which acetic acid possesses in a very high degree.

The chief use of acetic acid, however, is as a retarding agent, to moderate the too ready decomposition of the sensitive silver surface. Mixed with nitrate, or gallo-nitrate of silver in the talbotype process, it preserves the purity of the whites of the picture, partly owing, doubtless, to its property of preventing the precipitation of oxide of silver, on which it exercises a powerful solvent action. In the developing solution used in the collodion process, and also in the nitrate of silver bath, its beneficial effect, as a retarding agent, is very evident.

(To be continued.)

A Catechism of Photography.

IV.—GENERAL PRINCIPLES OF PHOTOGRAPHY.

(Continued.)

Q. What is the action of light in those instances in which the photographic picture is latent, or in other words, where is it necessary to employ a subsequent process to render the picture visible?

A. In these cases it is difficult to determine its mode of action, and all that we can offer is hypothetical. The opinion most generally received is, that a chemical action does actually take place although its effects are invisible.

Q. Is this hypothesis corroborated by facts?

A. It is so to a very considerable extent. 1st, by the fact that salts of silver are almost all reduced by the action of light. 2ndly, that in certain preparations the picture is slightly visible on being withdrawn from the camera, the sensitive coating having acquired a slightly brown tint, proving that a chemical action has taken place, and a sub-iodide or metallic silver formed.

Q. What is adducible from these facts?

A. That although the chemical action is in most cases invisible, it nevertheless actually takes place, and is solely attributable to the effect of light.

Q. Is this the only hypothesis which is held with respect to those photographs which require subsequent development?

A. No: it is thought by some persons that the separation of the combined molecules of iodine and silver is only partially performed by the light, and is completed by the action of the reducing agents used in the developing process. Here, as in the first hypothesis, we have a chemical action of light on the sensitive surface; but in this case the gallic acid or pyrogallic acid ought by itself, in contact with the iodide of silver, to develop the picture, which, so far as our experience extends, it fails to do.

Q. Is there a third hypothesis?

A. The third hypothesis assumes that the coating of silver is of such exquisite sensitiveness, that without any chemical action being produced, the light causes a disturbance of the molecules, and that these molecules, endowed with a certain magnetic action, acquire the property of attracting others to their surface. Whichever hypothesis be admitted, the subsequent action of the reducing bodies is easily explained.

Q. In what way is the action of the reducing agents explained?

A. With regard to the part performed by the reducing agents, we hold that the function of the re-agents which causes the appearance of the photographic picture, is to distribute over the surface molecules which fix themselves upon those parts which have been affected by the action of light, and to form a deposit in virtue of a force which is termed molecular attraction.

Q. Can you furnish any proof of these assertions?

A. If the object of the exciting bath was simply to continue the reduction of the iodide of silver, the reducing liquids (solution of gallic or pyrogallic acid, salts of protoxide of iron, &c.) would act without its being necessary to add nitrate of silver. Now, a sensitive collodion plate, perfectly washed and exposed for a certain length of time to the light, does not give the slightest trace of an impression. No picture appears after an immersion of four hours in gallic acid. Yet the same plate, if a little nitrate of silver be added to the gallic acid, furnishes a perfect picture.

Q. Why is this?

A. Because the nitrate of silver is decomposed by the gallic acid, and the silver is deposited on those parts which the light has affected.

Q. Can you mention any other proof?

A. As a second proof, it may be stated that the picture in numerous cases exists only on the surface of the plate, and may sometimes be effaced without injuring the collodion, the coating of iodide of silver remaining intact. If there had been a reduction of the iodide of silver it would have extended completely through the collodion film.

Q. Is any further proof adducible on this topic?

A. The last proof resulting from chemical analysis is conclusive. If the quantity of silver contained in the sensitive coating before the development of the picture be weighed and compared with the same coating after the development of a picture, it will be found that the second contains six times more silver than the first.

Q. How do you account for this?

A. This augmentation of weight can only arise from the deposit of silver formed by the reducing agents.

(To be continued.)

Correspondence.

TRANSPARENT POSITIVES ON GLASS.

Sir,—In your notes to the above title last week, you appeared to arrive, by true induction from the facts presented by foreign photographs, at the conclusion, that they had been copied from negatives by means of the *camera*, and not by *superposition*.

You may therefore be interested to learn, that after some experience, rather extensive for an amateur (extending to nearly a dozen gross) in the spring and summer of 1857, I abandoned superposition, and took to copying by camera entirely. The camera was mounted up against a north window, looking through the pane, and the negative at the polar region of the sky; the illumination of which, being much more constant throughout the day than any other part of the heavens, enabled that most difficult point in photography, viz. length of exposure for successive copies from the same negative, to be arrived at with some degree of precision.

To produce the best results, the right length of exposure is exceedingly important to hit; for, if overdone, the lights are sure to be dulled when the darks are brought out by development; and if underdone, there is no detail in the bright parts.

A very weak and transparent negative (as a plate originally brought out to be viewed as an opaque positive) would require only from two to three seconds, and with that, assisted by proper development afterward (pyrogallic and silver) would produce something like perfect black in the shadows, while the lights were almost as clear as the glass

itself; but with 5 seconds' exposure, the picture was dingy all over. A very dark and fogged negative, on the other hand, would need 3 or 4 minutes; but still, in that case, the resulting positive would be as fine and as refined as the 2 seconds' copy from the faint and clear negative, and, indeed, would appear very similar.

The above results are obtained when the chemicals are working well; but "fogging" has to be guarded against with extraordinary care. When the transparent positives are intended for the *stereoscope*, a small amount of fogging is, indeed, of no great harm, for it acts like the ground glass of the usual slides; but when they are used for the magic lantern, armed with electric or oxyhydrogen light, the smallest approach to fogging exerts the most prejudicial effect on the optical picture projected on the screen.

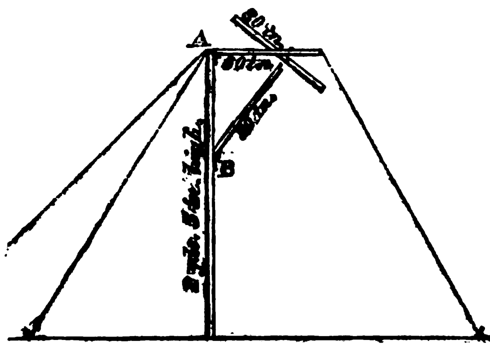
It will be understood that the medium operated on in all these cases was collodion (wet); and the developer, pyrogallic assisted by silver: when there was too little of the latter, the tint was rather inky and blue; but as the silver was increased, the shades became a pure black, producing the most admirable tones in the projected picture.

In short, some of my transparent positives on collodion were (although I say it, who should not say it) as fine specimens of that sort of photography as any that I have seen at home or abroad, showing therefore what the method is capable of; but, up to the last, I have not succeeded in controlling the occasional "fogging" tendencies of the bath and other agents employed. With every new negative, and every different day, some copies were lost before the right exposure could be found: that however I could submit to, and it was something that soon brought its own correction; but the odious "fogging" that would sometimes arise when I thought the chemicals in the best state, this is what tires out one's spirit, and breaks one's heart. I despair of satisfaction there until you, Mr. Editor, have taken up the subject of "fogging" in your "Photographical Dictionary," and have discussed, not only the way to avoid it in a new bath, but the way also of keeping it down in old baths also, notwithstanding the many untoward influences which arise when they are frequently and abundantly used.

October 1*st*, 1858. C. P. S.

PORTABLE TENT FOR TRAVELLING PHOTOGRAPHERS.

DEAR SIR,—I herewith send you a small model of the tent I wrote to you about. You must excuse the manner in which it is made. It will show you the plan, one I can well recommend. The framework can be made of some hard wood, such as oak, which would render it less bulky than if made of deal. The tent stands up without being in the ground; only three thin cords fastened by pegs from the points thus,



The top of the tent can be of what is called American cloth, which is light proof; the rest of the tent to be of either yellow calico or tammy, with some other colour, brown or black calico, as an outward cover, having a small square about 12×12 in. cut from off the outer one to facilitate the developing, and the bath could be made fast at a proper height to the upright pole, which is square. Below I give you the dimensions of the woodwork, and cost of the whole.

Hinges to be at A and B. A to fall down when not supported, and the support to fall down when not up, towards the lower end of the pole.

	s.	d.
Woodwork	2	6
American cloth	2	6
25 yds. yellow calico at 4½d. ...	9	4½
Brown calico	3	0
Cost of whole...	17	4½

Beaumaris. J. W. A.

Miscellaneous.

A SUBSTITUTE FOR CYANIDE OF POTASSIUM IN REMOVING STAINS FROM THE SKIN.—As a substitute for cyanide of potassium in cleansing the hands from silver stains, the following mixture has been suggested by a correspondent:—In a given quantity of distilled water dissolve 10 per cent. of chloride of ammonium, then add 10 per cent. of bichloride of mercury. This mixture may be preserved for any length of time in a stoppered bottle, which should be carefully labelled "poison;" for, though quite harmless when applied to the skin—it does not poison by absorption like the cyanide—it is a very active poison when taken internally. It may also be used to remove the stains of nitrate of silver from wearing apparel of every description; though its success is not so certain in the case of linen that has been sent to the wash since being stained. When the stains on the hands arise from a mixture of gallic or pyrogallic acid with the nitrate, the success of this recipe is less certain; the same, however, may be said of the cyanide of potassium.

SALT AN ANTIDOTE TO NITRATE OF SILVER.—There are so many photographers who are ignorant of the nature and qualities of the substances they use, that it may not be without interest to them to be made aware that, in the event of an intruder into their laboratory swallowing a piece of nitrate of silver, they have only to send to the kitchen for a remedy. "I was in the act," writes Dr. Ozouf, "of cauterising the pharynx of a child suffering from croup with a rather long pencil of nitrate of silver, when he closed his teeth tightly and bit off and swallowed about one-eighth of an ounce of this substance. The situation was very painful. The little sufferer, already weakened by the croup, and scarcely able to breathe, was rapidly sinking. I at once sent for some common salt, and administered a teaspoonful in a cup of *tisane*, which happened to be standing there. We were obliged to administer it through a funnel; and, at the end of a minute, the child threw up a white curdy precipitate which proved to be chloride of silver, insoluble, and consequently harmless. I repeated the operation five or six times, until the matter vomited contained no trace of poison, of which I assured myself by diluting it with water, so that it was quite limpid, and yielded no precipitate on being treated with salt. It is worthy of note that none of the nitrate was returned as such, the whole having been converted into chloride with marvellous rapidity. . . . . Contrary to my expectation, there was no gastric reaction. I had used about an ounce of salt; there would be no danger in using in a similar case as much as three times that quantity. It should be administered in small doses frequently repeated, so that it may be all used in decomposing the poison, and the administration continued until the matter rejected by the stomach yields no precipitate on being treated with the salt. After this it is only necessary to give emollient drinks, and, if requisite, to sustain strength by tonics."

MR. SARONY, of Scarborough, has introduced a useful improvement in the production of photographic portraits. It consists in employing two or more negative portraits to produce a positive portrait. The patentee usually proceeds by taking a negative portrait in which every portion of the figure excepting one is sacrificed, in order to obtain an accurate representation of that one portion, say, for example, the head and neck; and afterwards he takes another negative, in which the head and neck are sacrificed, in order that a correct representation may be obtained of the person below the neck, including

the hands and arms, or of those parts together with the lower parts of the figure; and, in taking the second portrait, in order that the hands may appear of the natural size, he removes the camera further back (if the hands be in advance of the other parts of the person), until it is about the same distance from the hands as it previously was from the head. From the two negatives thus obtained he prints the positive picture, printing from the first negative the head and neck, stopping out the hands and other parts of the person by masks, as is well understood; and, from the second negative, the hands, arms, and (if a third negative has not been taken) the lower parts of the figure also. —*Mechanics' Magazine.*

A FOREIGN contemporary contains the following singular narrative, on the authority of a paper published at Dijon:—M. Badet died a short time since after an illness of three months. He was in the habit, during his illness, of sitting at a window looking upon the street, where he remained motionless for hours together watching the passers-by. The house opposite was inhabited by a M. Peltrie, who was not a little surprised quite recently at seeing, to all appearance, the pale, thin face of the defunct M. Badet looking out of the same pane of glass. Great was his emotion, not to use a stronger word. He called in some of his neighbours to whom the visage of the deceased was familiar, and who likewise saw it distinctly. He then invited some men, whose testimony could not be doubted, to come to his house, and who added their authority to his statement. He then pointed out the apparition to the family of the deceased, who, after satisfying themselves of its existence, had the pane of glass removed immediately. "It is, therefore, beyond a doubt, that the glass had taken the impression of the face of the sick man as if it had been daguerreotyped—a phenomenon that might be explained, if on the side of the room opposite the window there had been another window, by which the solar rays could have fallen upon M. Badet; but this was not the case, the room having only one window."

Photographic Notes and Queries.

EMPLOYMENT OF A CAMERA AS A MAGIC LANTERN.

SIR,—Can you tell me whether all, or any of the lenses of a 3½ portrait combination could not also be used as the lens for a magic lantern, just to enable me to show tolerably a photograph, as an illustration of a subject at some private lectures?

2dly. What would be the best way to print or take a photograph for use in a lantern?

3dly. A question which I think may be useful to many beginners:—Is there any way of removing stains from clothes some time after they have been made? J. S. K.

[The lens of a portrait combination is the very best that can be used in a magic lantern; and a little ingenuity will soon enable any one to make a very satisfactory instrument for throwing a magnified transparent photograph on a screen.

A transparent picture on glass must be first obtained (see vol. i. p. 22); this should not be larger than the ordinary sized picture which the lens will well cover; then place it in the position occupied by the sensitive plate, or ground glass, and fasten it there, so that light can pass *through* it, but not get into the camera at the sides. Now place a bright lamp behind the picture, and a white screen in front of the camera, in the position usually occupied by the sitter, and the magnified image will be seen. Condensers and reflectors may be used for concentrating the light on the picture; or, if these are not at hand, a moderator or paraffine lamp *with the globe on* may be placed close to it; but, in any case, all light but that which passes through the picture and camera must be carefully excluded from the room. The focussing may be effected in the usual manner, and if the white screen be in the position originally occupied by the *sitter*, and the small transparent positive be the exact size of the negative from which it was copied, the magnified picture will appear life size; and if painted with transparent colours, will produce the most startling effects. We have heard of very serious results arising from an amateur having thoughtlessly exhibited at a private party in this way a coloured portrait of a deceased friend. The second and third queries are answered at pages 22 and 20.]

THE WAXED PAPER PROCESS.

SIR,—Will you kindly inform me, in an early number of the "PHOTOGRAPHIC NEWS," if there is any modification of the waxed paper process, by which an interval of a week or ten days may be allowed to intervene between the exposure in the camera and the development? If not, it would not be a bad idea for some experimental photographers to endeavour to hit upon a plan to achieve that object. Prepared wax paper, with this advantage, would be far better for tourists than any dry process on glass, as the negatives would be almost as sharp—and fifty prepared sheets would not be as heavy as, or more bulky than, half a dozen glass plates of a similar size. Having to develop within twenty-four hours from the time of exposure, and the development requiring large porcelain or glass trays, and taking so much time, are serious inconveniences to tourists, especially to pedestrians, who generally stop at a strange hotel every night, where such a tedious development cannot be well carried on. AN IRISH AMATEUR.

Dublin.

[According to our experience in the above beautiful process—and we have worked at it perhaps as much as any one—the only precaution necessary to be taken, when much time is to elapse between the exposure and development, is plentiful washing. We never tried many experiments with the express view of ascertaining how long the sensitive paper might be kept; but if washed in two changes of distilled water, and then carefully dried, and shielded from the light in blotting paper, ten days or a fortnight may safely be allowed to elapse between rendering sensitive and developing. The exposure may take place at any time in that fortnight, and the exposed sheets can be kept in safety for the remainder of the time.]

ELECTRO-PLATING OLD DAGUERREOTYPE PLATES.

SIR,—I should think it a great favour if you would let me know, through your "PHOTOGRAPHIC NEWS," the receipt to make solution of silver for electro-plating with the galvanic battery plates for daguerreotype. — Yours respectfully, D. E.

[Dissolve chloride or cyanide of silver in a solution of cyanide of potassium, in the proportion of 3 parts of the latter to 1 of either of the former.

The strength of the solution is not of much consequence. A convenient strength will be for the solution to contain one fiftieth of its weight of silver. It has recently been found that when cyanide of potassium is used as the solvent, it gradually decomposes, with formation of carbonate of potassa, which interferes somewhat with the regularity of the precipitation. To obviate this, cyanide of calcium has been recommended as the solvent; the carbonate of lime resulting from its decomposition falls to the bottom, and does not interfere with the process. Plates when silvered in this solution have a dead appearance, and will require to be burnished. It is a curious fact, that if a very small portion of bisulphide of carbon be added to the bath, the silver will be deposited perfectly bright, and with the metallic lustre. A few drops of the bisulphide may be added to a pint of plating solution,

and after well agitating, and allowing to stand for 24 hours, the bath will be ready for use.

The battery to be used for this purpose may be a single cell of Smee's construction, the size and strength must of course vary with the area of the surface to be silvered.]

ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES.

SIR,—I see in No. 5, that a correspondent, signing himself "Subscriber," wishes for information on the subject of artificial light for photographic purposes.

I send you the following means of producing an intense light at a cheap rate:—Provide zinc tubes, ⅝ or ¾ of an inch in diameter; ram full of bengal- or signal-light composition, a recipe for which was given in a recent number of the "PHOTOGRAPHIC NEWS." On being fired, the combustion of the zinc, along with the composition, throws out an intense light, of great actinic power; the fumes arising from it must be avoided, as they are extremely deleterious.

This is rather similar to the Photogen, but is, I think, an improvement, as the composition does not burn with such great rapidity when confined in the tubes as it does in a loose state.

Your correspondent does not state for what purpose he requires artificial light, whether for copying or portraiture? For the latter, I do not think it would be so advantageous, in consequence of the glare incidental to all such lights. For printing collodion transparencies, I have no doubt it would do extremely well. I have not used it for this purpose, but merely throw it out as a hint for the benefit of your numerous readers.

I must give you my meed of praise. Your journal unites all the good qualities of a scientific magazine, and will prove invaluable to all photographers.—I am, yours truly,

Glasgow. T. B.

ON COPYING PAINTINGS BY MEANS OF PHOTOGRAPHY.

DEAR SIR,—I have perused many photographic works, and made many inquiries of practical photographers upon a point which, I believe, if you could elucidate, you would indeed oblige many of your readers—your humble servant among the number. Do you think it possible to copy an oil picture, so as to give the necessary representation of distance, with all that beautiful gradation of tints used to obtain it in landscape painting? Suppose, as an illustration, I wish to copy a heath-scene, represented in the picture as under a blue sky with fleecy clouds: now, the foreground is a rich, brown heath, and the distance terminates with a range of blue hills, almost melting into air, giving a beautiful and natural effect. Now, would the blue of the distance and sky—being so much more energetic in its influence upon the sensitive plate than the white clouds—alter the position of the tints, and the more retiring become the most prominent; and would not the whole of the yellow gradations in the foreground, if not wholly lost, become far too faint? So that it seems to me to be almost an impossibility to obtain an exact counterpart of an oil painting. For instance, do you think it would be possible to photograph truly one of Turner's gorgeous sunsets? An article treating upon this, or an invitation to some of your artistic correspondents for a contribution on this subject, would, I am sure, be very welcome to most of your subscribers.—I remain, your obedient servant and subscriber, AN INQUIRER.

[An answer to this query will be found in our first column.]

FRENCH BACKGROUNDS.

DEAR SIR,—In a recent impression of the "NEWS," I find one of your correspondents wishes to know the plan of making a French background. The plan adopted by most professionals is as follows:—Take the negative, never mind what the background is. Having done so, print a copy, and cut the figure carefully out; this may be managed very nicely with a small pair of scissors: then take that part from which the figure is cut; place it in the pressure frame, printed side downward, of course; lay the negative upon it, and, by holding it up to the light, adjust it with the thumbs, so as to cut off all but the figure. Thus printed, it will give a white background. Now lay it on the outside of the pressure frame (there are frames sold expressly for this purpose, but this plan will answer); place the figure cut from the first proof—which is called the dummy—nicely on the last printed one; lay a plate of glass on them to keep them in contact; expose again to the light, and, with a piece of card, you may produce any shade you please. W. C.

Ipswich.

VARNISH FOR NEGATIVES.

DEAR SIR,—Your correspondent, "Veritas," in No. 3 of the "NEWS," wishes to know of a good varnish for negatives. I am not acquainted with the French article mentioned there in your answer to him; but if he will try the following, he will, I think, find it to answer perfectly:—Good shell-lac, 30 grains; rectified spirit of wine, 1 ounce; dissolve and filter.

The plate requires to be warmed before the varnish is applied; it also requires to be held before the fire while drying, which takes a few seconds. Should the varnish, made according to the above formula, be either too thick or too thin, the remedy is simple and evident.

I should have written you before this time on this matter, but your number, owing to some neglect of my bookseller, has just come to hand.—Yours truly,

Bervie, N.B. T. C.

SPOTS ON COLLODION POSITIVES.—REMOVAL OF THE BLACK VARNISH FROM GLASS POSITIVES.

DEAR SIR,—I am extremely obliged for the information you have afforded me at page 35 of your valuable journal; but you will doubtless like to know I had previously corrected the defect, by adding 1 ounce of silver dissolved in 5 ounces of water to the bath, and that, ever since then, the pictures have come out admirably. Prior to the addition mine was a 30-grain bath, slightly iodised, and only about three weeks old.

With reference to removing black varnish from glass positives, I have found that by pouring a little of the common crystal varnish sold in the shops over the black varnish, it causes fluidity immediately, and can be removed with a cloth.—Yours much obliged,

Pentonville. J. C. W.

ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES.

DEAR SIR,—1. The following is a good recipe for a powerful white light for night photography:—

Nitrate of potassa	7 parts.
Sulphur	2 "
Black sulphuret of antimony	1 "
Red oxide of lead	1 "

Let all the ingredients be very dry, and the nitrate of potass not too finely pounded.

2. Has any one attempted a photograph of the comet?

I am, dear sir, your well-wisher, CHURK.

FORMULA FOR FRENCH SPIRIT VARNISH.

A correspondent has favoured us with the following recipe in answer to an inquiry made in a previous number:—

SIR,—In the third number of the "NEWS," p. 36, you ask for the recipe of the spirit varnish imported from France. The following, I believe, is nearly, if not quite the same:—

Spirits of wine	1 pint.
Gum sandrach	4 ounces.
Best gum mastic	½ ounce.

Yours truly, NIT. SIL.

ANSWERS TO MINOR QUERIES.

To Copy Engravings, &c., Full Size.—*Forward* asks how to take a full-sized copy of an old picture. The body of the camera must be lengthened until the lens is distant from the focussing glass exactly double its natural focal length. The picture to be copied must then be placed the same distance in front of the lens, and it will be represented on the ground glass of its natural size. The stop, in the case of a landscape lens, should be placed nearer the lens than usual; and, if a partial combination be used, it should be between the lenses. (We hardly understand the other queries.)

Ripple Marks on Collodion.—*P. F. P.* has inclosed a print from a collodion negative which is covered with diagonal ripple marks similar to fine scratches, about one-fiftieth of an inch apart. This appearance might be caused by inattention to several points. In the first place, if the glass plate be not judiciously rocked after the collodion has been poured back into the bottle, similar marks will take place; too much pyroxyline in the collodion, or using the latter down to the dregs, might produce them. The most likely cause is, however, the presence of water in the collodion, introduced in the ether (by using *washed* ether before it is rectified), or by employing too dilute alcohol. The second picture is "fading away" through insufficient washing.

Dark Vehicle for Stopping out Skies of Paper Negatives.—*W. M.* asks whether it is possible to obtain a dark vehicle which can be worked properly on waxed paper negatives, to darken skies, or otherwise improve them. We have not succeeded very well by employing paint for this purpose; we think a preferable plan is, to print a positive on plain salted paper, and then, without fixing, cut out the sky carefully with a sharp pair of scissors, and fasten it on to the back of the faulty negative.

Fothergill's Process.—Many of our correspondents have asked us for information on this subject. We would gladly give the results of our experience; but, as many of our readers have no doubt had much greater practice in it than ourselves, we should consider it a favour if they would come forward with the required information, and assist both our correspondents and ourselves at the same time.

Converting Positives into Negatives.—*Q. E. D.*—In preparing the solution recommended by Maxwell Lyte for converting positives into negatives, the strong hydrochloric acid should be diluted with six times its bulk of water, and then as much bichloride of mercury dissolved in this as it will take up. (Your other queries have been already answered.)

TO CORRESPONDENTS.

**** We are daily expecting a Photoglyphic Steel Plate, kindly engraved by Mr. Talbot expressly for the* Photographic News. *As soon as we receive it we shall have impressions printed, and issue a copy with each Number of our Paper. This we hope to be able to do with the next week's Number. We hope to be able to give at the same time Mr. Talbot's full description of the process.*

W. C., Ipswich.—We are much obliged for the information, and have inserted it in another part of the "News." In answer to the query on the fogging of the dry plates, we have sometimes met with the fault alluded to, but have never satisfactorily made out the cause; it seems to depend on the state of dryness of the plate before exciting. The process was a very good one at the time of publishing, but we have now given it up for more recent and superior ones. Try Fothergill's.

J. W. C.—We are obliged for the information, and have made use of it in another part of the "News." The piece of camphor may be as large as a pea, and should be placed in the filtered solution; the latter will then keep for six months at least, so a good stock of solution may be prepared at once.

C. L. S.—Your fixing solution was not strong enough; add double the quantity of hyposulphite of soda.

Oval.—Perhaps a touch of black varnish would fill up the holes and scratches on your negatives if in the sky. The hand and experience of a good artist, however, would be required if the faults were in the more important parts of the negative.—We can only explain the phenomenon mentioned by the supposition that the glass had been marked in some way or other with the figure before the picture had been taken. It is sometimes excessively difficult to remove such stains from glass; they seem to have eaten into the substance.

J. U.—Leave out the nitric acid in your formula for the developing solution; or, better still, try the recipe given at p. 12.

Albumen.—1. It depends on how you have recovered it. 2. An article will shortly appear on the subject. 3. If kept in glass or porcelain, no; if in gutta percha, yes. 4. We cannot possibly tell. 5. Very slightly acid.

J. Pouncy.—1. The print shall be sent as soon as it is returned by the person who now has it.

Chirurgus.—A portrait lens should have small stops to fit in front of the first lens, and it will then do for views, although not quite so well as a proper view lens. The difficulty mentioned cannot be well remedied. With respect to the processes named, we prefer that marked No. 2.

W. D. W.—Were the robes white or black? We presume the former, and should then recommend, in order to avoid the fogging, employing a medium-tinted background, and a smaller stop to the lens.

A. R.—We hope to be able to give the required information in an early number.

A. R. R. L.—The only cause we can imagine is, the possible presence of a bromide in large quantities in the collodion. Your formulæ are good.

Amateur.—A negative bath should be used. The gradual accumulation of acetate of soda in the bath would tend to put it out of order.

Regular Subscriber, Chelsea.—Would not our advertising columns be more suitable for your case? We cannot undertake to mention such things in the body of the "News."

A Lancashire Lad.—Try the formulæ given at pp. 33 and 35.

Delta.—1. Yes. 2. We have seen Indian-rubber gloves for the purpose. Remember, "A cat in gloves catches no mice." 3. We have used a still for preparing distilled water, and even for rectifying alcohol, without the thought of excise officers entering our head; but we do not know whether we may not have been liable to some severe penalty.

A Well-wisher.—1. Add a few drops of acetic acid to each of your baths; that will cure them. 2 and 3. Already answered in recent numbers. 4. The order of mixing is immaterial. 5. The object of adding nitrate of potassa to the developing solution containing sulphate of iron, is to produce a nitrate of iron by double decomposition. (Vide our "Chemistry.")

A Novice.—Add a little alcohol to your collodion. If we understood your description rightly, that will remedy the fault.

Dilemma.—Your cyanide of potassium is either too impure or too weak to dissolve the iodide of silver. Try hypo.

M. N.—We fancy the honey was not quite pure. We *sometimes* (but seldom) have met with the effect you mention. Add a few drops of acetic acid to it.

G. H.—1. Add a few drops of acetic acid to your bath. 2. We do not know any good plan.

A. L.—P.—Agnes.—Collodion.—A Subscriber.—Xtra.—Our correspondents will see that it is out of our power to save them the trouble which is indispensable in mastering the principles of any science.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—J. G.—Tint.—Williams.—Young Photographer (Halifax).—W. H.—J. T.—A Reader and Scotsman (try Fothergill's).—H. C., Cheltenham.

Communications declined with thanks:—F. W.—A. L.—Alman.—J. J. J.

In Type.—T. Barrett.—W. D.—E. W. B.—J. S. P.—Ignoramus.—R. W. H.—Perseverance.—Z.—R. D.—An Aquatint Engraver.—H. D.—Nit. Sil.—H. C.—J. C. L.—Young Amateur.—W. B. N. C.—T. Gulliver.—F. H.—A. M.—Earnest.—An F. C. S.—J. B.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

Vol. I., No. 7.—*October* 22, 1858.

DESCRIPTION OF MR. FOX TALBOT'S NEW PROCESS OF PHOTOGLYPHIC ENGRAVING.

We have been favoured by Mr. Fox Talbot with the following description of his new invention, taken from the specification of the patent which has just been enrolled.

"The process described in this specification, to which I have given the name of 'Photoglyphic Engraving,' is performed in the following manner:—

"In this invention, I employ plates of steel, copper, or zinc, such as are commonly used by engravers. Before using a plate its surface should be well cleaned; it should then be rubbed with a linen cloth dipped in a mixture of caustic soda and whiting, in order to remove any remaining trace of greasiness. The plate is then to be rubbed dry with another linen cloth. This process is then to be repeated; after which, the plate is in general sufficiently clean.

"In order to engrave a plate, I first cover it with a substance which is sensitive to light. This is prepared as follows:—About a quarter of an ounce of gelatine is dissolved in eight or ten ounces of water, by the aid of heat. To this solution is added about one ounce, by measure, of a saturated solution of bichromate of potash in water, and the mixture is strained through a linen cloth. The best sort of gelatine for the purpose is that used by cooks and confectioners, and commonly sold under the name of gelatine. In default of this, isinglass may be used, but it does not answer so well. Some specimens of isinglass have an acidity which slightly corrodes and injures the metal plates. If this accident occurs, ammonia should be added to the mixture, which will be found to correct it. This mixture of gelatine and bichromate of potash keeps good for several months, owing to the antiseptic and preserving power of the bichromate. It remains liquid and ready for use at any time during the summer months; but in cold weather it becomes a jelly, and has to be warmed before using it: it should be kept in a cupboard or dark place. The proportions given above are convenient, but they may be considerably varied without injuring the result. The engraving process should be carried on in a partially darkened room, and is performed as follows:—A little of this prepared gelatine is poured on the plate to be engraved, which is then held vertical, and the superfluous liquid allowed to drain off at one of the corners of the plate. It is held in a horizontal position over a spirit lamp, which soon dries the gelatine, which is left as a thin film, of a pale yellow colour, covering the metallic surface, and generally bordered with several narrow bands of prismatic colours. These colours are of use to the operator, by enabling him to judge of the thinness of the film: when it is very thin, the prismatic colours are seen over the whole surface of the plate. Such plates often make excellent engravings; nevertheless, it is perhaps safer to use gelatine films which are a little thicker. Experience alone can guide the operator to the best result. The object to be engraved is then laid on the metal plate, and screwed down upon it in a photographic copying frame. Such objects may be either material substances, as lace, the leaves of plants, &c., or they may be engravings, or writings, or photographs, &c., &c. The plate bearing the object upon it is then to be placed in the sunshine, for a space of time varying from one to several minutes, according to circumstances; or else, it may be placed in common daylight, but of course for a long time. As in other photographic processes, the judgment of the operator is here called into play, and his experience guides him as to the proper time of exposure to the light. When the frame is withdrawn from the light, and the object removed from the plate, a faint image is seen upon it—the yellow colour of the gelatine having turned brown wherever the light has acted. This process, so far as I have yet described it, is, in all essential respects, identical with that which I described in the specification of my former patent for improvements in engraving, bearing date the 29th October, 1852.

"The novelty of the present invention consists in the improved method by which the photographic image, obtained in the manner above described, is engraved upon the metal plate. The first of these improvements is as follows:—I formerly supposed that it was necessary to wash the plate, bearing the photographic image, in water, or in a mixture of water and alcohol, which dissolves only those portions of the gelatine on which the light has not acted: and I believe that all other persons who have employed this method of engraving, by means of gelatine and bichromate of potash, have followed the same method, viz., that of washing the photographic image. But however carefully this process is conducted, it is frequently found, when the plate is again dry, that a slight disturbance of the image has occurred, which, of course, is injurious to the beauty of the result; and, I have now ascertained, that it is not at all necessary to wash the photographic image; on the contrary, much more beautiful engravings are obtained upon plates which have not been washed, because the more delicate lines and details of the picture have not been at all disturbed. The process which I now employ is as follows:—When the plate, bearing the photographic image, is removed from the copying frame, I spread over its surface, carefully and very evenly, a little finely-powdered gum copal (in default of which common resin may be employed). It is much easier to spread this resinous powder evenly upon the surface of the gelatine, than it is to do so upon the naked surface of a metal plate. The chief error the operator has to guard against is, that of putting on too much of the powder: the best results are obtained by using a very thin layer of it, provided it is uniformly distributed. If too much of the powder is laid on it impedes the action of the etching liquid. When the plate has been thus very thinly powdered with copal, it is held horizontally over a spirit lamp in order to melt the copal; this requires a considerable heat. It might be supposed that this heating of the plate, after the formation of

a delicate photographic image upon it, would disturb and injure that image; but it has no such effect. The melting of the copal is known by the change of colour. The plate should then be withdrawn from the lamp, and suffered to cool. This process may be called the laying an aquatint ground upon the gelatine, and I believe it to be a new process. In the common mode of laying an aquatint ground, the resinous particles are laid upon the naked surface of the metal, before the engraving is commenced. The gelatine being thus covered with a layer of copal, disseminated uniformly and in minute particles, the etching liquid is to be poured on. This is prepared as follows:—Muriatic acid, otherwise called hydrochloric acid, is saturated with peroxide of iron, as much as it will dissolve with the aid of heat. After straining the solution, to remove impurities, it is evaporated till it is considerably reduced in volume, and is then poured off into bottles of a convenient capacity; as it cools it solidifies into a brown semi-crystalline mass. The bottles are then well-corked up, and kept for use. I shall call this preparation of iron by the name of perchloride of iron in the present specification, as I believe it to be identical with the substance described by chemical authors under that name—for example, see 'Turner's Chemistry,' fifth edition, page 537; and by others called permuriate of iron—for example, see 'Brande's Manual of Chemistry,' second edition, vol. ii. page 117.

"It is a substance very attractive of moisture. When a little of it is taken from a bottle, in the form of a dry powder, and laid upon a plate, it quickly deliquesces, absorbing the atmospheric moisture. In solution in water, it forms a yellow liquid in small thicknesses, but chestnut-brown in greater thicknesses. In order to render its mode of action in photographic engraving more intelligible, I will first state, that it can be very usefully employed in common etching; that is to say, that if a plate of copper, steel, or zinc is covered with an etching ground, and lines are traced on it with a needle's point, so as to form any artistic subject; then, if the solution of perchloride of iron is poured on, it quickly effects an etching, and does this without disengaging bubbles of gas, or causing any smell; for which reason it is much more convenient to use than aquafortis, and also because it does not injure the operator's hands or his clothes if spilt upon them. It may be employed of various strengths for common etching, but requires peculiar management for photoglyphic engraving; and, as the success of that mode of engraving chiefly turns upon this point, it should be well attended to.

"Water dissolves an extraordinary quantity of perchloride of iron, sometimes evolving much heat during the solution. I find that the following is a convenient way of proceeding:—

"A bottle (No. 1) is filled with a saturated solution of perchloride of iron in water.

"A bottle (No. 2) with a mixture, consisting of five or six parts of the saturated solution and one part of water.

"And a bottle (No. 3) with a weaker liquid, consisting of equal parts of water and the saturated solution. Before attempting an engraving of importance, it is almost essential to make preliminary trials, in order to ascertain that these liquids are of the proper strengths. These trials I shall therefore now proceed to point out. I have already explained how the photographic image is made on the surface of the gelatine, and covered with a thin layer of powdered copal or resin, which is then melted by holding the plate over a lamp. When the plate has become perfectly cold, it is ready for the etching process, which is performed as follows:—A small quantity of the solution in bottle No. 2, viz., that consisting of five or six parts of saturated solution to one of water, is poured upon the plate, and spread with a camel-hair brush evenly all over it. It is not necessary to make a wall of wax round the plate, because the quantity of liquid employed is so small that it has no tendency to run off the plate. The liquid penetrates the gelatine wherever the light has not acted on it, but it refuses to penetrate those parts upon which the light has sufficiently acted. It is upon this remarkable fact that the art of photoglyphic engraving is mainly founded. In about a minute the etching is seen to begin, which is known by the parts etched turning dark brown or black, and then it spreads over the whole plate—the details of the picture appearing with great rapidity in every quarter of it. It is not desirable that this rapidity should be too great, for, in that case, it is necessary to stop the process before the etching has acquired sufficient depth (which requires an action of some minutes' duration). If, therefore, the etching, on trial, is found to proceed too rapidly, the strength of the liquid in bottle No. 2 must be altered (by adding some of the saturated solution to it) before it is employed for another engraving; but if, on the contrary, the etching fails to occur after the lapse of some minutes, or if it begins, but proceeds too slowly, this is a sign that the liquid in bottle No. 2 is too strong, and too nearly approaching saturation. To correct this, a little water must be added to it before it is employed for another engraving. But, in doing this, the operator must take notice, that a very minute quantity of water added often makes a great difference, and causes the liquid to etch very rapidly. He will therefore be careful, in adding water, not to do so too freely. When the proper strength of the solution in bottle No. 2 has thus been adjusted, which generally requires three or four experimental trials, it can be employed with security. Supposing then, that it has been ascertained to be of the right strength, the etching is commenced as above mentioned, and proceeds till all the details of the picture have become visible, and present a satisfactory appearance to the eye of the operator, which generally occurs in two or three minutes; the operator stirring the liquid all the time with a camel-hair brush, and thus slightly rubbing the surface of the gelatine, which has a good effect. When it seems likely that the etching will improve no further, it must be stopped. This is done by wiping off the liquid with cotton wool, and then rapidly pouring a stream of cold water over the plate, which carries off all the remainder of it. The plate is then wiped with a clean linen cloth, and then rubbed with soft whiting and water to remove the gelatine. The etching is then found to be completed.

"I will now describe another etching process, very slightly differing from the former, which I often use. When the plate is ready for etching, pour upon it a small quantity of the liquid (No 1—the saturated solution). This should be allowed to rest upon the plate one or two minutes. It has no very apparent effect, but it acts usefully in hardening the gelatine. It is then poured off from the plate, and a sufficient quantity of solution (No 2) is poured on. This affects the etching in the manner before described: and, if this appears to be quite satisfactory, nothing further is required to be done. But it often happens, that certain faint portions of the engraving—such as distant mountains or buildings in

a landscape—refuse to appear; and as the engraving would be imperfect without them, I recommend the operator, in that case, to take some of the weak liquid (No. 3) in a little saucer; and, without pouring off the liquid (No. 2) which is etching the picture, to touch with a camel-hair brush, dipt in liquid (No. 3), those points of the picture where he wishes for an increased effect. This simple process often causes the wished-for details to appear, and that, sometimes, with great rapidity, so that caution is required in the operator, in using this weak solution (No. 3) especially, lest the etching liquid should penetrate to the parts which ought to remain white: but, in skilful hands, its employment cannot fail to be advantageous, for it brings out soft and faint shadings which improve the engraving, and which would otherwise probably be lost. Experience is requisite in this, as in most other delicate operations connected with photography; but I have endeavoured clearly to explain the leading principles of this new process of engraving, according to the method I have hitherto found the most successful."*

H. F. Talbot.

HISTORICAL SKETCH OF PHOTOGRAPHIC ENGRAVING.

As Mr. Fox Talbot's discovery has created considerable interest in the scientific world, a brief synopsis of what has hitherto been done would seem to be a fitting sequence to the full description we have given above.

The first who appears to have had any idea of heliographic engraving was Nicephore Nièpce. According to M. Aimé Girard the first proof taken by him by means of this process bears date 1827, some dozen years before the discovery of photography. This process, which is now almost forgotten, was very simple; it consisted in spreading a thin layer of bitumen of Judea upon a copper or pewter plate, which was then placed in the camera, where it was allowed to remain some hours, until it had received the impression of the external objects towards which the lens was directed. On withdrawing the plate it was submitted to the action of the essence of lavender, which dissolved the portions of the bitumen not acted upon by the light, leaving the metal bare, while the remaining bitumen reproduced the design. Passing the plate afterwards through an acid solution it was found that it had eaten hollows in the metallic plate, while the other parts were preserved by the protecting varnish. Such was the process that M. Nièpce revealed to Daguerre when he entered into a partnership with him. Nièpce died in 1833, after struggling twenty years, during which he spent his time and money in endeavouring to perfect his discovery, poor and almost unknown.

Six years later, that is in 1839, M. Daguerre made the discovery public. In the meantime he had considerably improved on Nièpce's process, but the discovery of photography led to the abandonment of the process for some years.

The next process to which we shall refer is that of M. Fizeau. He took a daguerrean plate and submitted it to the action of a mixture of nitric, nitrous, and hydrochloric acids, which did not affect the whites of the picture but attacked the blacks with a resulting formation of adherent chloride of silver, which speedily arrested the action of the acid. This he removed by a solution of ammonia, and the action of the acid was continued, and this process he continued until a finely engraved plate was the result; but the lines of this plate were not deep enough to allow of prints being taken from it; and to remedy this, he covered the plate with some drying oil and then wiping it from the surface, left it to dry in the hollows. He afterwards submitted the plate to an electro-chemical process which covered the raised parts with gold, leaving the hollows in which the varnish remained untouched. On the completion of the gilding this varnish was removed by means of caustic potash, and the surface of the plate covered with *grains de gravure* producing what is technically termed *aquatint* ground, and the deepening of the lines proceeded with by means of the acid. The daguerrean plate was by these means converted into an engraved plate, but as it was silver it would have worn out very soon; to obviate which an impression was taken on copper by an electro-chemical process, which could of course be renewed when it showed signs of wear.

On the 29th of Oct., 1852, Mr. Fox Talbot patented his process, which was somewhat similar to that which has been subsequently adopted by MM. Pretsch and Poitevin, as regards the substance first used—viz., a mixture of bichromate of potash and gelatine—but the remaining portion of the process was conducted on the same principle, though in a different manner, to that of M. Fizeau; but Mr. Fox Talbot's new discovery has so completely thrown his previous one in the shade that we need not describe it.

In 1853 M. Nièpce de St. Victor, the nephew of Nicephore Nièpce, took up his uncle's plan, and with the assistance of M. Lemaitre—who had also assisted his uncle—endeavoured to perfect it: but, though he modified and improved it, his success was not very great; it was always found necessary to have the assistance of an engraver to complete the plate.

After this many others, among whom may be enumerated MM. Lerebours, Lemercier, Barreswil, Davanne, and finally Poitevin, endeavoured to obtain a design by similar means on stone. The last appears to have succeeded. His method is based on the chemical reaction of light on a mixture of gelatine and bichromate of potash. This mixture, which when made is perfectly soluble in water, becomes insoluble after exposure to the light. His mode of proceeding is as follows:—He spreads the mixture on the stone, and after drying lays the negative upon it and exposes it to the light. After a suitable exposure the negative is removed, and the portions not acted upon by the light are washed away with water, and the design remains with the property of taking the ink like an ordinary lithographic crayon. The stone is then transferred to the press and proofs taken in the usual way. It is said that excellent pictures have been obtained from the stone after 900 copies had been pulled.

The process of M. Charles Négre, which at the present moment excites so much attention in Paris, is more complicated than the preceding, but yields superior results. His process appears to be not unlike that of M. Fizeau. He employs acids to eat the lines into the plate, and at a certain stage of the process it is submitted to the action of a galvanic bath which plates it with copper, silver, or gold, according to circumstances. By his process the half-tones are produced with more delicacy than by any similar one except, as we think, the new process of Mr. Fox Talbot. Our readers, however, will be in a position to judge for themselves when we are able, through the kindness of the latter gentleman, to present them with a print from a plate engraved by his process.

ON DRY COLLODION.

BY M. COLLARD.

The attention of most photographers has been for a long time past directed to the subject of dry collodion, and the numerous experiments and researches to which it has given rise prove the deep interest which is felt in this process. The inconveniences inherent in the employment of wet collodion in out-of-door operations are so numerous, as to render its use almost impossible. In fact, if we want to take a picture of a monument or a landscape, we require a tent, and so many other things, that it is difficult to move about with them; hence the reason why the questions of the preserved collodion and dry collodion have occupied so much space in photographic journals. We term those collodions preserved which are covered with a layer of gelatine, gum, or any similar substance. I have very little confidence in the different processes that have been described, the

* A photoglyphic steel plate is, through Mr. Talbot's courtesy, being prepared by him for the "Photographic News." We hope to present a proof from it with each copy of our next week's number.

results of which, in the first place, leave much to be desired, and have the further disadvantage of complicating the easy and simple operation of the collodion; if we must complicate the operation by other manipulations, it would be better to recur to albumen, or simply adhere to the Taupenot process, which, whatever may be said to the contrary, possesses indisputable merit. I have recently seen proofs obtained, by means of this process, by a very able amateur, M. Lejeune, of Vic-sur-Seille, and I sincerely congratulate him on the success of his labours, which redound as much to his credit as to that of the process.

The Taupenot method, like all other inventions, has had its defenders and detractors; generally, however, it was favourably received, inasmuch as it, at the same time, contented the partisans of collodion and those of albumen: the alliance of the two rivals was consummated, they joined hands, and agreed to journey together. Alas! this *entente cordiale* was not of long duration; the collodion, which had at first consented to take the first steps in the dry way protected by albumen, soon wanted to walk alone. Abbé Desprats, MM. Duboscq, Franck de Villecholles, Herman Krone, of Dresden, Clifford, of London, and, finally, M. Quinet, one after the other pointed out the virtues of dry collodion.

All collodion suitably iodised is capable of giving proofs by the dry method, especially after being strengthened with a slight dose of resin; the collodionised glass is sensitised in a bath of nitrate of silver at 6 per cent., then washed perfectly in two or three waters, and afterwards dried in darkness. MM. Robiquet and Duboscq use yellow amber instead of resin; but I prefer resin, as it dissolves more easily in collodion than amber. According to the Abbé Desprats the exposure in the camera is not much longer in the dry method than in the wet; but I do not share that opinion: experience has shown me that dry collodion is two or three times less sensitive than the wet collodion; but that is of little importance in my estimation, dry collodion being intended exclusively for the reproduction of inanimate objects.

An English photographer, Mr. Clifford, recommends the washing of the collodionised glass with common beer, containing 3 per cent. of nitrate of silver, and 2 per cent. of acetic acid. Mr. Clifford professes to preserve his glasses in this way for four or five days; but this method does not appear to merit any great attention: the argentiferous beer bath must, of necessity, leave on the collodionised glass free nitrate of silver, while it cannot be too often repeated, that one of the essential conditions of the success of the dry collodion is precisely the elimination of every trace of nitrate of silver by repeated washings. A very able operator, M. Herman Krone, of Dresden, holds an opinion diametrically opposed to that of Mr. Clifford. Not only does he thoroughly wash the collodionised glass on removing it from the silver bath, but he submits it to a solution of chloride of sodium at 2 per cent., the object of which is to change the nitrate of silver into chloride of silver insoluble in water; the glass is afterwards rinsed in several waters, and then left in darkness to spontaneous desiccation. In this way M. Krone preserves his glasses eight or ten days, and for two days they remain almost as sensitive as wet collodion. The proofs obtained by M. Krone are really admirable; I have seen views of Dresden and its environs, which are *chefs d'œuvre*. M. Quinet also took up the question of dry collodion, and the results he obtained from his experiments were really astonishing, both as regarded the quickness of the pose, and the beauty of the negative. When he presented his collodionised glasses to the French Photographic Society, one of the members present, himself a distinguished photographer, expressed doubts as to the success of the process when applied to glasses of large dimensions. I am in a position to reassure both him and the partisans of the dry collodion in this respect. I was present with M. Quinet when he repeatedly took views of the Hotel de Ville on glasses of 60 centimeters, using for the purpose a simple object glass of 6 inches, with a focus of 1m. 45s., and furnished with a diaphragm of 2 centimeters diameter; the weather was dull at the time, yet the proofs were obtained in about 5 minutes....

One question which has not been settled is, whether it is or is not necessary to wash the dry collodion glass on removing it from the camera; I have tried both methods, without finding any great difference in the results; only by soaking the glass with water before covering it with the developing solution, cloudiness, streaks, and spots are avoided.

Another question:—Ought the glass to be plunged in the nitrate bath before developing it? is a point upon which photographers are not agreed; for my part, I consider it an absolute necessity. Without doubt the dry collodion process remains to be developed and perfected; such as it is at present, however, it is capable of rendering great services; and I would recommend photographers to adopt it in preference to the albumen and other mixed processes.

ON THE EMPLOYMENT OF NITRATE OF URANIUM IN PHOTOGRAPHY.

BY M. CRESPON.

A passionate admirer of photography, I follow with the greatest interest all the improvements which are introduced from day to day in the processes of this marvellous art. . . . .

All those who saw the proofs obtained with the nitrate of uranium were struck with the delicacy and the faithfulness with which the original was rendered, and with the harmonious gradations of the light half tones; and some fancied that there was nothing more to discover, and that chlorides, hyposulphites, and innumerable washings were no longer required. . . . Unfortunately the process leaves much to be desired, especially on the score of stability; and if the reactions necessarily produced be considered, it will be perceived that it could not be otherwise; for, leaving out all theoretical explanations of the part played by the nitrate of uranium in this process, it cannot be disputed that the action of the light greatly modifies its molecular constitution, and perhaps its composition, since the picture on being withdrawn from the frame is entirely formed, and in part visible.

There is more in this than a simple absorption of light, the *rôle* of the nitrate of uranium is not purely passive; and it may be hoped that among the numerous metallic salts, other than those of silver, platinum, and gold, one will be met with which will admit of deoxidation on contact with the modified nitrate of uranium, and produce the complete development of the picture.

If we admit that nitrate of uranium in presence of organic matters may be decomposed by the action of the luminous rays, and that a part of its acid, being eliminated, leads to the formation of a neutral or basic nitrate, almost if not quite insoluble, it is evident that mere washing in water cannot carry away the portion of the salt held in the pores of the paper. Besides, the immersion in the nitrate of silver must necessarily produce insoluble salts, such as chlorides and carbonates, which, being precipitated in the pores of the paper, water cannot wash off. That this is so, the subsequent action of the light evidently demonstrates, as this affects only the whites of the proof, the blacks, it is to be hoped, being beyond alteration; this, however, time alone can prove. Oxide of silver is far from possessing an absolute stability, and it may be that a part of the inconveniences attributed to the use of the hyposulphite of soda, results from the slow reaction of accidental impurities in the paper on the compound of silver, which forms the blacks of the picture obtained by the chloride of that metal. . . .

It has been stated that uranium proofs resist boiling cyanide of potassium; I have found them yield to this solution, even when cold. . . .

I extract the following notes from my register of observations on the experiments I have made with uranium:—

The sheets prepared with 20 per cent. of the nitrate of uranium in water, and floated ten minutes on this solution, are in good condition for obtaining fine and vigorous positive prints. This bath is good until exhausted. It is not so when gelatinised paper is used, for after a small number have been submitted to it, the uncoagulated gelatine gradually dissolves in the uranium bath, and in the end prevents the certain and equal preparation of the papers, and thus leads to the loss of considerable quantities of this salt. There are plenty of methods of coagulating gelatine, such as a gallic acid bath; but these substances colour nitrate of uranium a reddish brown, and, besides, tend to make the process more complicated. It therefore only remains for those photographers who desire to avail themselves of the good results offered by the employment of gelatine, to do so at as small a sacrifice as possible of nitrate of uranium. This will be best accomplished by pouring upon a glass the exact quantity required for each sheet of paper; and by following the method of M. de la Blanchère in the other operations, very nice proofs will be obtained, which would leave nothing to desire if they were only permanent. But unfortunately they are not, and to assure one's-self of this, it is only necessary to expose half of one of these pictures to the sun, while the other half is screened from it: after a few hours' exposure the difference in the appearance of the two halves will be very perceptible. These alterations arise from salts that the rapid washings have not been able to dissolve; while, on the other hand, if the washings be prolonged, the paper becomes spotty. It is necessary, therefore, to find a fixing solution which will enable this process to give all the good results it promises. The plan I have found to succeed best is the following: on taking the proof from the frame, and after passing it through the silver bath, and giving it three or four washings, I put it on a chloride of gold bath, or better a bath of sel d'or or hyposulphite of gold of Fordos and Gélis; and after toning the proof, I *pass* it through a feeble hyposulphite of soda bath: by this means the little chloride or other insoluble salts that have formed are removed. The exposure of the proof to the hyposulphite of soda ought not to be prolonged, for this would be to fall into the drawbacks of the old process. It must be afterwards washed in three or four waters, and then left to soak, in a considerable quantity of water, for two hours.

The pictures treated in this way had gained greatly in stability, for though exposed to the sun during the whole of a long day in June, they were in no way altered. As to the hyposulphite of soda, we have in this case nothing to fear from its destructive effects, since it merely acts as a solvent, and the reactions arising from its prolonged contact with large quantities of chloride of silver cannot be produced.

Proofs that have undergone a too prolonged exposure to the sun may be brought back to very soft and harmonious tones, by prolonging the stay in the hyposulphite of soda. I must also observe, that there is a great advantage in toning the proof in the *sel d'or* before submitting it to the hypo., for, if the proof be plunged into the latter bath on being withdrawn from the nitrate of silver, it loses much of its vigour.

As regards the silver bath, it frequently alters and gives only incomplete proofs. I attribute the cause, not to the exhaustion of the nitrate, but rather to the accidental formation of foreign salts, which change its effects and nature.

Another remark worthy of attention is, that with negatives which are feeble or too uniform it is difficult to obtain satisfactory positives; and it is more especially when commercial nitrate of silver is employed, that we are exposed to this annoyance, which, moreover, is just as likely to happen in the chloride of silver proofs, as in the silver baths which serve to make the negatives on collodion. Fused nitrate of silver tends on the contrary to exaggerate the opposition of the lights of the negatives, and it is by a judicious choice of these nitrates, or by their mixture in different proportions, that we may derive the best possible results from negatives notably different in intensity. . . . .

The use of bi-chloride of mercury has not given me the satisfactory results I expected from it; its corroding action destroys the harmony of the half-tones, and, besides, the duration of the exposure is much too long. I owe to one of my chemical friends the idea of substituting for chloride of mercury, a nitrate of the same base, employed in a somewhat different manner. On withdrawing the proof from the silver bath, I pass it on a concentrated solution of nitrate of mercury, when it acquires tones of an unexpected richness, and at the same time completely preserves the whites

Photographic Chemistry.

NATURE OF THE METALS.

(Continued.)

All the metals enumerated above form combinations among themselves or with non-metallic bodies. Their combinations with each other are for the most part little known; they are badly defined and in variable proportions; they have received the generic term of alloys, with the exception of the alloys with mercury, which are termed *amalgams*. In uniting with non-metallic bodies, metals form definite compounds; those united with any non-metallic body other than oxygen have received the name of *mineral salts;* among these are included chloride, bromide, and iodide of silver; salts that are formed by a combination of silver with bromine, iodine, and chlorine. Before we proceed to remark on the nature of *salts* generally, we will offer a few observations on the oxides formed of different metals which enter more or less directly into photographic operations. To begin with that commonly considered the most precious—gold; this metal combines with oxygen in at least two proportions, forming protoxide and peroxide of gold. To form the protoxide 4 parts of oxygen combine with 100 of the metal; to form the peroxide 12 parts of oxygen combine with 100 of gold. When 100 parts of gold have combined with 4 of oxygen the mass, after a short time, undergoes decomposition, and one-third of it deprives the other two-thirds of its share of the oxygen, which is therefore reduced again to its original state of metallic gold. It combines with chlorine, iodine, bromine, sulphur, and phosphorus. A portion of this metal dropped in a mixture of nitric and muriatic acids dissolves with effervescence, and the result is chloride of gold, the substance so extensively used for toning photographic pictures. In the event of any of our younger readers trying experiments with the oxides of gold and acids, we will inform them that the peroxide dissolved in muriatic acid and precipitated with ammonia forms a detonating powder which explodes if rubbed.

The metal which of all others is of the most importance in photography is *silver*. It combines with oxygen, and the resulting protoxide combined with nitric acid gives nitrate of silver. This metal also combines with chlorine to form chloride of silver; with iodine to form iodide of silver; with bromine to form bromide of silver; and also with sulphur selenium and phosphorus.

Iron in some of its numerous combinations enters largely into photographic operations. Its lowest combination with oxygen produces protoxide of iron, a substance composed of 100 parts of the metal, and 28·572 of oxygen; this, exposed to a red heat, absorbs half as much more oxygen, forming peroxide of iron, which is, therefore, formed of a combination of 100 parts of the metal, with 42·857 of oxygen To reduce peroxide to protoxide, it is only necessary to heat it to whiteness. This metal is generally found as an oxide; and very commonly combined with sulphur. This sulphuret of iron is termed iron pyrites. When combined with nickel it is identical, or nearly so, with what has been termed *meteoric iron*, immense masses of which have been discovered at different times; one of which, described by Professor

Pallas, was found on the top of a mountain in Siberia, that weighed nearly 1,600 pounds. Another mass was found in South America some years ago, that weighed about 30 tons; and, in the Imperial Museum, at Vienna, there is a mass of this metal, which was *seen* to fall from the atmosphere. Iron, united with chlorine, forms a chloride; but the combinations in which this metal enters, that are most interesting to photographers, are those with sulphuric acid, with which it combines in different proportions; of which we need only mention two,—the sulphate of protoxide of iron, and the sulphate of peroxide of iron. The former substance (known in commerce as green vitriol) is formed of a combination of protoxide of iron and sulphuric acid. As a reducing agent, it is a good deal used in photography, and a weak solution of it is used to develop collodion pictures; it absorbs the oxygen of the atmosphere with great rapidity; and forms an insoluble basic sulphate of peroxide of iron, and a similar neutral sulphate which remains in solution, the presence of which, however, does not appear to have any prejudicial action on the reducing properties of the sulphate of protoxide. The second salt, the sulphate of peroxide, is formed of 1 equivalent of peroxide of iron, and 3 equivalents of sulphuric acid. It can be prepared by adding nitric acid, and afterwards sulphuric acid, to a solution of sulphate of protoxide of iron, and evaporating this liquid to dryness; the yellowish-white residue is the substance under consideration; this dissolves in water, to which it gives a brown tint, and a solution of it is sometimes used for fixing collodion proofs; a process it accomplishes by destroying the sensibility, and not by dissolving the sensitive body.

Copper combines with chlorine, and the result is a chloride, and also with bromine and iodine, forming analogous salts: it also combines, in different proportions, with oxygen, forming a suboxide and a protoxide; and a sulphuret can be obtained by heating copper filings with sulphur; but, as none of its compounds are used in photography, it will not be necessary for us to describe them.

Lead is one of the softest metals; it melts easily, and, if continually stirred when fused, it absorbs oxygen, and is converted into an oxide. It combines with oxygen in three different proportions; 100 parts of the metal, combining with 7·692 of oxygen, forms the protoxide; the combination with 11·538 of oxygen, the deutoxide; and the combination with 15·384 of oxygen, forms peroxide of lead. The oxidation yields the substances known in commerce as massicot, litharge, and red-lead. Lead is easily acted upon by various liquids; nitric acid, even when diluted, attacks it rapidly; and it is also oxidised by some spring waters, and especially by distilled water, in contact with the air. Like the preceding metal, it is of little present use to photographers.

Tin is another metal of no present value to photographers; it combines with many substances, viz., oxygen, chlorine, iodine, bromine, phosphorus, sulphur, and fluorine. It forms two oxides; the protoxide, consisting of 100 parts of metal, combined with 13·793 of oxygen; and the peroxide, which, with 100 parts of the metal, combines 27·586 of oxygen.

Zinc is a metal which, like tin, is never found native, but always in combination with oxygen, sulphur, or some other substance. It combines with chlorine, and is set on fire by that gas; it also unites with phosphorus, sulphur, iodine, and selenium. Heated to a red heat in the atmosphere, it becomes volatile; but the vapours combine with the oxygen, and condense in flakes of such exceeding lightness, that it was formerly termed "philosophical wool," and "white nothing;" this powder is the oxide of zinc. Zinc decomposes water with facility in the presence of an acid; it takes possession of the oxygen, and liberates the hydrogen, a property which chemists take advantage of for obtaining hydrogen, and also for reducing the chloride of silver, and restoring it to a metallic state. The levigated zinc white is also used for polishing glass plates.

(*To be continued.*)

Dictionary of Photography.

Acetate.—Salts formed by the union of acetic acid with a basic oxide are called acetates; thus acetic acid and potassa (oxide of potassium) unite and form the salt acetate of potassia, acetic acid and oxide of silver unite and form acetate of silver. All acetates dissolve in water, most of them readily. Their dilute aqueous solutions decompose on standing, with formation of carbonates and mouldy substances; the alkaline acetates are especially liable to this decomposition. When mixed with dilute salts of the peroxide of iron, the yellow colour is changed to red. When added to a solution of nitrate of silver, they throw down delicate white shining scales of acetate of silver.

Acetate of Ammonia is very difficult to prepare or keep in the pure state, owing to the tendency which it has to form an acid salt. When required in photography, it is invariably prepared by mixing ammonia and acetic acid together until the liquid is neutral or only slightly acid to test paper.

This salt has been recommended by M. Humbert de Molard, for hastening the development of the negative in gallic acid. Its action is to continue the change commenced by light, but unless great care be taken, the proof is very liable to darken all over. However, in some cases, with caution, very good results can be obtained by its means, when it is desired to develop rapidly.

Acetate of Iron.—Mr. Hardwich has recommended this salt of iron for developing collodion negatives under circumstances where lowness of temperature or other retarding causes would prevent the full and complete action of pyrogallic acid. Indeed, its powers of rendering the detail in shadows with distinctness without over-doing the lighter portions is so great, that it is not unlikely, that the employment of this salt as a substitute for pyrogallic acid, would be attended with a marked advantage in many cases, especially where it is desired to copy paintings or similar subjects.

The following formula is recommended :—

Sulphate of iron	12 grains.
Acetate of lead	12 "
Beaufoy's acetic acid	$1\frac{1}{2}$ drachm.
Water	1 ounce.

The acetate of lead and the acetic acid are to be dissolved in half of the water, and the sulphate of iron in the other half. Add the two together, allow the whole precipitate of sulphate of lead to settle, and then decant or filter off the clear liquid for use.

Another formula, easier to make, and giving almost equally good results with the above, is as follows :—

Sulphate of iron	12 grains.
Acetate of soda	6 "
Beaufoy's acetic acid	$1\frac{1}{2}$ drachm.
Water	$6\frac{1}{2}$ "

These are to be simply mixed together, and when the acetate of soda and sulphate of iron are dissolved, the mixture will be ready for use.

It is advisable that, in using this developer, the solution be not allowed to remain longer on the film than is really necessary, as otherwise there will be danger of an appearance of fogging in the shadows of the picture. The plate is also more sensitive to diffused light in either the operating room or camera. The

solution must also not be poured in a stream on one part of the plate, but must be allowed to flow gently but rapidly across from an edge or corner, by placing the mouth of the glass containing it almost touching the plate, otherwise the nitrate of silver will be washed away from that part of the surface of the plate upon which the developing solution falls, and a spot of very feeble development will be the result. If the temperature be high, the action of the above solutions will be too energetic, and water must be added.

Acetate of Soda is obtained by neutralising acetic acid with carbonate of soda, and then evaporating,—or by precipitating acetate of lead with carbonate of soda, filtering the solution from the precipitated carbonate of lead, separating the slight quantity of lead which may still remain in the liquid by means of hydrosulphuric acid, and evaporating the solution till it crystallises, which it does in oblique rhombic prisms. The salt dissolves readily in water, and is frequently employed in photography for the purpose of replacing a strong acid, such as nitric acid, by the weaker acetic acid; nitric acid having a stronger affinity for soda than is possessed by the acetic acid, unites to that base, and the acetic acid becomes free.

For the employment of acetate of soda as an accelerating agent, *see* Accelerator (*ante*).

(*To be continued.*)

A Catechism of Photography.

IV.—GENERAL PRINCIPLES OF PHOTOGRAPHY.

(*Continued.*)

Q. What is that force described in the last hypothesis called?

A. *Molecular attraction.*

Q. What is the cause of molecular attraction?

A. We are at present unacquainted with the cause of this attractive force; it is one of the physical phenomena of chemistry, but its origin is involved in obscurity. The appearance of the photographic image on a metal plate, paper, or glass in the developing process belongs to this class of phenomena. The light imparts to the sensitive surface an attractive force, and the agents which are employed in the development of the picture produce the molecules which obey that attractive force.

Q. What distinction exists between the hypotheses advanced?

A. In the first two a direct chemical effect is said to take place on the sensitive surface; in the third we have no apparent physical influence exerted, but the application of the reducing agents produces precisely similar effects as in the other cases.

Q. Explain more fully this molecular action.

A. When the reducing agents are brought to bear on the nitrate of silver, that nitrate is decomposed, the molecules of the silver are set at liberty, and settle upon those parts of the sensitive surface which have been operated upon by the action of light; that action which is invisible to us is detected by the molecules of silver, which group themselves, so to speak, on the parts thus affected.

Q. Is the action of the light on the sensitive surface more intense at one part than at another?

A. It is, and this is illustrated in the development of the picture, and completely bears out our last hypothesis.

Q. In what way?

A. We observe when the deposit of molecules is forming, the attracted force is in proportion to the decomposition which has taken place, and the high lights are consequently much more rapidly developed than the half tints, as the action of the light has been more intense, and the consequent accumulation of the molecules of silver is much greater. Where the reducing agent is very energetic, as the sulphate of protoxide of iron, the picture is more rapidly developed, but with less distinction and brilliancy than when developed by the gallic acid. The reason of this is, that the silver, being more rapidly reduced, settles all over the picture, obscuring the half tints, and failing to bring out effectively either the bright lights or deep blacks of the picture. In the second instance, where the gallic acid is employed, the silver is gradually liberated, and slowly settles on the most prominent parts of the photograph, effectually bringing out all its lights and shadows.

Q. To return from these hypotheses, what distinction is there generally made as to the action of light on sensitive surfaces?

A. There is a distinction made between total and partial action. The first is where the picture is visible, and requires no developing process; the second, where it is invisible when removed from the camera, and has to be developed by another process.

Q. What have we chiefly to consider in the latter instance?

A. The action of the light, and the action of the reducing agents.

Q. What is known as to the action of light?

A. The action of light on the sensitive surface is not known with any degree of certainty. As we already noticed, three hypotheses are held respecting it:—1st, That the light produces a *real* though invisible effect on the salt of silver; 2nd, that the molecules which compose the silver are separated, and that the reducing agent completes the separation; 3rd, that it exercises on the sensitive surface an unknown physical influence.

Q. What is known as to the action of the reducing agents?

A. The reducing agents complete what the light has begun; they develop the picture, by depositing a precipitate of silver (on the theory of molecular attraction) on those parts which have been affected by the action of light.

(*To be continued.*)

Correspondence.

PORTABLE CAMERA AND DEVELOPING BOX.

FROM MR. T. BARRETT, REIGATE.

Dear Sir,—I now send you a description of the apparatus I have constructed, and used with success, for taking stereoscopic collodion negatives without a tent or dark room. The apparatus is all contained in a case 12 inches high, 12 long, and 7 broad,—to be made of the black glazed cloth used for umbrella cases,—with two buckle straps round it, through which another strap may be passed to carry over the shoulder, or a piece of wood by way of handle, to carry by hand. The case must have a foundation of thin wood. Pack inside this two cases made of the same material. Let it also contain the brass ring for the tripod stand, two gutta percha bottles, one for water and the other a small one to contain a saturated solution of hypo.; also a small strap to carry the bath box (when moving only a short distance), and one or two cloths. No. 1 of the last-mentioned cases is 11 inches high, 4¾ long, 7 broad, and contains:—1. The camera; 2. Plate box (in the camera); 3. Shutter to slide into the back of the camera after the object is focused (Fig. 1); 4. The focusing glass in a frame, set in the centre of a piece of wood which is exactly the width of the cell on the top of the camera; 5. A piece of wood shaped as 5 in Fig. 1, with two pegs to fit into holes at the bottom of the camera, serving as a stop to keep the centre of the plates and of the focusing glass in the centre of the lenses. It must be covered with a piece of thick bibulous paper wrapped round it, or the plate will be stained by touching it; 6. A thin piece of

wood that slides into grooves, cut from the back to the front of the camera, in the centre of the top and bottom, to separate the lenses. Care must be taken that the groove into which the back shutter falls, is deeper than this groove, or the light would pass through it. To pack the plate box in the camera,

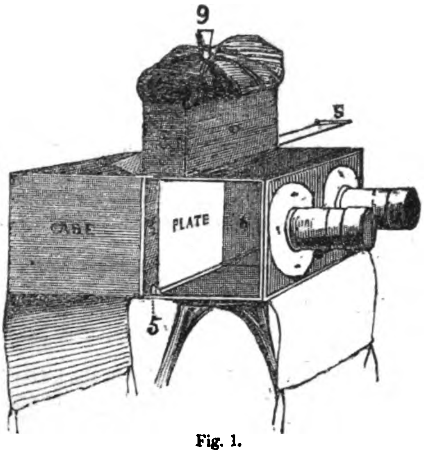


Fig. 1.

this thin piece of wood (6) and the piece (5) take out. No. 2 case is 11 inches high, 5 long, 7 broad. It contains:—7. Box containing the baths; 8. Dark chamber; 9. American clip, which must have a strong piece of india-rubber round it to make it clip tightly. Both lenses may also be packed in this case, or one may be carried separately to make it lighter. The lenses are double combination, and stops for them of different diameters may be carried in a small pocket at the side of No. 1 case. Two small pockets in this (No. 2) case contain a small bottle of collodion, and separate pieces of cloth to wipe the tops of the baths if found wet on removing the covers. Figure 1. The camera (section). It is not to be taken out of No. 1 case when in use, the portion beyond the back serving to screen the light in focusing. It is drawn in the figure as in use. It is 5¾ inches long, 4½ high, 6¾ wide (outside measure), made of ¼ inch mahogany; a cell must be cut out at the top of the camera across the width for the projecting piece (*b*) of the dark chamber to fit into; it should be 5⅞ inches long and ⅞ wide, and the centre of it 4¼ inches from the front of the camera; the raised back of the piece of wood (5) should come exactly under the centre of it. The camera is open at the back that the plate box may pack inside it,—one half of the front must be made to slide in after its lens is screwed into it. My lenses are 3 inches apart from centre to centre. The plate box is 8½ inches high, with the lid. The grooves for the plates must not come beyond 3 inches of the top of the box, that the wet collodion end of the plates when put in may be above the grooves and not be rubbed at the edges; it is made to contain 12 plates (patent plate), and must fit inside the camera. The plates are 7¾ inches long, by 5⅜ wide, and must be scratched across 3 inches from each end, to prevent the collodion slipping. The box for the baths (Fig. 2) is 6¼ inches high without the lid, 7½ by 4⅜, the lid to fasten with hooks. It has two pieces cut out at the bottom, *a b*, exactly the size of the baths, and a false bottom inside, which, when the box is reversed, falls down on to stops, that the baths when placed in their respective cells may rest on the false bottom, so that the tops when the covers are removed may be exactly level with the (then) top of the box—the box being reversed. The baths are the water-tight gutta percha (Burgess and Key's), and are 4 inches deep, ⅞ths of an inch wide, and 6 long, and the projecting piece (*b*) of the dark chamber must exactly fit them. The baths and covers should be marked S and D, and the same outside the box, to prevent using the wrong bath.*

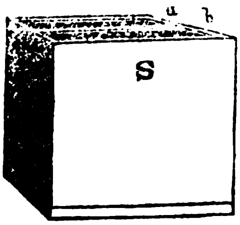


Fig. 2.

STRONG NEGATIVES FROM FAINT GLASS POSITIVES.

Sir,—The answer requested by yourself and correspondent in your last week's number, p. 57, viz., how to make transparent copies on glass from faint positives, will be found pretty fully treated in my letter of last Wednesday, by this time, I hope, safely arrived.

I have not much therefore to add, but can at least assure your correspondent that the desideratum he proposes is perfectly practicable, viz., that anything visible on a collodion positive by reflected light, *i. e.*, an excessively weak negative by transmitted light, may, by the camera process described in my last, be copied without sensible loss of definition, and without change of size, into a *transparent* positive of much power, fit either for the stereoscope or the magic lantern; and that then, by a similar proceeding, this transparent positive may be copied in its turn into a second negative, with any amount of intensity for printing on paper; and these proofs from the second negative will still retain so much definition, as to repay examination with the magnifying glass. Let no one therefore urge against a collodion positive (by reflected light) that it does not admit of multiplication; for, with the intervention of those two copying steps, it is not only enabled to turn out a good printing negative, but will turn out any number of similar negatives, so that we may have a dozen proofs printing at once from as many negatives, all of the same original glass positive, containing a record perhaps of some fleeting impression, too momentary to have allowed of a strong original negative being taken in the camera.

All this is possible, and I have done it; but many refinements are needed to do it well. First, the camera:—The lens may be the same as that by which the first picture was taken, the camera box being lengthened to double its former focus, and the picture to be copied placed at an equal distance in front of it; but a special form of lens for this sort of copying has been made, which will give better definition. Some trouble must be incurred in causing the optical image of the first picture to fall on, and exactly fit, the ground glass for the second; but the apparatus, once arranged, will suit any number of succeeding cases. If the picture is stereoscopic, one of the pictures only must be copied at a time, the glass being held in a small frame, sliding in grooves transversely to the optical axis, so as to allow of, first one, and then the other picture, being brought in front of the lens.

If we now look through the photograph to be copied, it is, to the eye, an excessively weak negative, and the numerous details visible when it was before viewed as a positive are gone, that is, gone to the human or optical eye; but not so to the photographic eye of the collodion plate, that sees them still, and presently renders them so that they are manifest to all. With this excessive sensibility, however, to delicate shades, it is necessary that the original photograph, though it be faint, should be clean, and even without blotches from unequal development, or spaces of washing away of the reduced silver by too much ablution, for all these faults will be terribly intensified. Then again, spots, holes, hairs, dust, &c., will of course be copied, and on the second negative we shall have its own dust spots, the dust spots of the original faint negative, the dust spots of the transparent positive. Hence, the more the first formation of any dust spots can be guarded against, the better, and one mode of decreasing them is, not to varnish the pictures undergoing the copying process. They do not need the varnish, for they are exposed to no mechanical action, as in copying by superposition, and every varnishing adds one, or more, sometimes many more, dust spots to the

* The remainder of our Correspondent's letter will be given in the next number.

plate. Good wet collodion, when there is absolutely no fogging, is perhaps the best material for working with in this process; but of late, when I have not succeeded in this devoutly-to-be-desired consummation, I have been trying dry collodion plates with unexpected satisfaction; their lights were very clear, their shadows intense, their manipulation easy and quick, and, in a box of a dozen plates, there was not a single bad one.

Edinburgh, October 12th, 1858. C. P. S.

PATENTS FOR DOUBLE PRINTING.

Sir,—If a certain process has been practised by several persons for some years, and if that process be afterwards patented by another, does that patent hold good? I put this question, because, in your last, appears a paragraph extracted from the *Mechanics Magazine* relating to a patent taken out by Mr. Sarony, of Scarborough, for printing from various negatives. This system has been in use for many years. The first description of it, I remember, appeared in the *Photographic Journal, September 21st*, 1855, by Berwich and Annan; it has also been carried out very successfully by Mr. Rejlander, Mr. Robinson, and others, as you are well aware.

I have not seen any specimens of Mr. Sarony's wonderful new invention, but I have heard that its chief value, as applied or misapplied to portraits, is, to put an old head on young shoulders; the head being taken from the person to be represented, the body from another person, and, perhaps, the hands from another. It is related that Zeuxis, some two thousand years ago, painted his famous picture of Helena from five of the most beautiful virgins the town of Cratona could afford, "uniting all the most admirable parts in one single figure;" and Zeuxis was right: but it is pushing ideality too far, to make a photographic representation of one person from various models, *and patent it.*

Lux.

Miscellaneous.

Photographic Copies of Bank Notes Prevented.—Recently several attempts to counterfeit bank notes by means of photography have been successful; and this fraud has not been confined to bank notes—other valuable documents having been copied in a similar manner. It was thought that this kind of fraud was rendered impossible by printing the documents referred to in ink of two different colours, so that photography should reproduce them both in black. It was soon found, however, that while black ink, which has carbon for its basis, remained unassailable by any chemical reagent, the ordinary coloured inks could be easily removed from the paper, and a photographic copy then taken of the remainder. A subsequent operation was employed for printing in the coloured ink, upon this paper, that portion which had been expunged from the original. It is obvious, therefore, that what was wanted was a coloured ink capable of resisting all chemical agents; and this, it is said, has been found by Mr. George Matthews, assisted by Dr. Sterry Hunt, of Montreal, by calcined oxide of chromium, a substance of a fine green colour, which, manufactured into an ink, known as "Canada Bank Note Tint," is used for printing a geometrical design on the ground of the bank note, upon which the value and denomination is afterwards impressed in black ink in the usual way. This method of printing bank notes is now in extensive use in Canada and the United States. The process has been patented in England.

Sensitiveness of Iodide of Silver to Light.—M. Ed. Fortin has published some remarks on the sensibility of iodide of silver; he says:—"It is now a well-known fact that, for iodide of silver to be sensitive to light, it must necessarily have been prepared with an excess of silver; in this condition, if an excess of iodide be added, all sensitiveness disappears; the same is the case with bromides, chlorides, &c., of the same metal; the sensitiveness returns when the requisite excess of silver is added. But what is more curious and less known, although in conformity with the theory which led to my discovering it, is, that a layer of sensitive iodide, or of bromo-iodide of silver upon paper or glass, exposed to either diffused light, or to that which emanates from a lens, not only loses all sensitiveness in an iodide bath, but also all traces of the impression caused by the light. Thus, when a collodionized glass, or a sheet of prepared paper has been sensitized, and exposed in a camera for the time necessary to obtain a proof, if, instead of developing it, it be placed for an instant in an iodide bath, the action of the light upon it is annihilated, and it may be sensitised anew, and a fresh impression may be obtained upon it without any trace of the first picture being visible on development: the plate behaving precisely like a new plate which has never been used."

Photographic Notes and Queries.

THE ALABASTRINE PROCESS.—COLLODION POSITIVES ON CLOTH.—VIGNETTE POSITIVES.—BACKGROUND WITH LIGHT CENTRE.

Sir,—Allow me to congratulate you on again coming before the public as the editor of a first-rate journal which is, like "Fothergill's Process," the best out.

No doubt some of your readers are, like myself, fond of anything new, so I should like to mention a few dodges, which perhaps a great many don't know, and many do.

I see a deal about the alabastrine process for glass positives, which produces exquisite whites. It is said they have not the unpleasant blue cast of those done by *the* chloride of mercury process. But it is evident, from the yellowness of the iodide of silver left undissolved on the edge of the plate, that they are done by *a* chloride of mercury process. After fixing the positive, wash away the cyanide and soak in hot water to free it from all traces of that reagent; drain, place on a levelling stand, and pour on re-developing solution composed of 1 ounce water, 20 drops saturated solution of bichloride of mercury in muriatic acid, 20 grains protosulphate of iron, 12 grains nitrate of potash, ½ drachm alcohol, and allow it to remain on five or ten minutes until the desired effect is gained.

Taking direct positives on oil cloth, &c. This may be done by fastening the oil cloth to a glass plate with white wax, and proceed by cleaning, &c., in the usual way. If the oil cloth be of inferior quality, the warp and shute showing prominently through the blacks, coat it with a varnish made of mineral naphtha, asphaltum, and Indian rubber dissolved in bisulphide of carbon, and allow it to dry before coating with collodion, &c. Card may be used in the same way by coating one side with gelatine, Iceland moss, or any other substance, to prevent the varnish from soaking through. Some prefer transferring the film in order to get the rights and lefts correct. The quickest way to do this is to use a thick collodion giving a very skinny film, and take the picture. After fixing and washing lay the plate in a dish of water—slightly acid with sulphuric acid—and in a short time the film will be seen floating above the plate. Get the plate under the film, allowing a little to hang over one edge, and lift it out of the dish. Hold the plate in your left hand and take the oil cloth in your right and rub it on your trowsers until it is warm, which will cause it to expand, then lay it on your film, work out all air bubbles with your fingers, and separate the oil cloth from the glass at the end where the film hangs over.

There are many ways of vignetting paper positives besides using vignette glasses and apparatus between the camera and object. A vignette glass may be made by pasting an oval piece of black paper on a piece of white, and taking a negative with the lens out of a focus. A vignette portrait may be made by cutting a hole in a piece of millboard and holding it over the pressure frame whilst printing and keeping it gently in motion to prevent its printing the outline hard. Or lay the above millboard on the pressure frame and place cotton wool all round the inner edge so as to go thinner towards the centre. A good way is to get a

broken passe-partout, minus the glass, and paste a piece of wet tissue paper on the back, so that when dry it will be tight like a drum. When dry take a brush and some gamboge and paint all round the edge; then take Indian ink and stroke off towards the centre, to give the required effect, and lay it on the frame whilst printing, which will take very little longer, from the light coming through the paper.

Some wish to get a white place behind the head. To do this you must paint the background of your negative the same as for positives, so that no light can get through it, by grinding raw umber with drop black, and flake white with gum arabic and water, brushing it on wet. Print two pictures and cut the first one out round the figure, and allow it to blacken in the light, then take the one cut out and lay it on the other, so that the light will not injure it, and expose in the pressure frame with a piece of cotton wool over the place intended to be white, and keep it gently moving to give the proper gradation of shade; or cover the whole with a piece of black paper, and lift each corner alternately to allow the light to get under the sides as far as required. A print from a negative of this description may, on being covered up, have another negative of a landscape, &c., laid on to print background. SAPIENT.

[We are much obliged to "Sapient" for his letter, and shall be pleased to communicate any more of his ingenious "dodges" to our readers.]

NEUTRALISING THE NITRATE BATH.—CHLORIDE OF CADMIUM.—POWDERY PYROXYLINE.—POSITION OF THE STOP IN A LENS.

SIR,—In using oxide of silver to neutralise a nitrate bath containing acetic acid, I have produced a quantity of *snow-like* crystals (acetate of silver, I suppose) which remain floating in the bath, and, of course, render it useless; can it be made all right again? I have about 20 ounces of it. I have tried to make collodion as recommended at p. 35, but I cannot make chloride of cadmium dissolve. I have tried various means, dissolving them separately, and then mixing, and also triturating them together in a mortar, but all to no purpose; I got nothing but a thick, cream-like liquid. I also tried a few drops of water, but got the same result. What must I do to make them dissolve? In preparing powdery pyroxyline, is it advisable to have the temperature of the acids heated so high as 170° or 180° Fahrenheit, and how long should the cotton remain in the mixed acids? What distance should a stop be placed in front of a 2½ view lens, with 14 inches focus? In copying photographs with a portrait combination, should the stop be in front or between the lenses? Knowing the practical value of the above queries, I have been rather lengthy in my communication; I hope you will deem this a sufficient apology.

PERSEVERANCE.

[Our correspondent has produced acetate of silver, by the union of the acetic acid in the bath with the oxide of silver used for neutralising it. The presence of this body in small quantities is rather an improvement with some collodions, but, in too great quantities, it is very prejudicial: the best plan to follow in such a case as the above is, to make the bath as cold as possible (near the freezing point), and then to filter it from the crystals; the low temperature will cause the greater part of the nitrate of silver to crystallise out.

The easiest plan to get a refractory substance to dissolve is, to triturate it together with the liquid used as a solvent in a mortar; the plan of adding a few drops of water previously to the salt, is likely to be injurious. The solubility of chloride of cadmium depends upon the strength of the alcohol used. If our correspondent will follow the above plan, using all the alcohol which we recommended, he will succeed in getting all, or nearly all dissolved. The slight residue, if any, may with safety be disregarded.

The temperature of the mixed acids in preparing powdery pyroxyline should not exceed 160° Fahrenheit; the cotton may remain in the acids for about half a minute.

We have found the best position for a stop in front of a view lens, provided that the lens be properly calculated and achromatised for photographic purposes, to be *as far off* as it is possible to put it *without* giving dark corners to the picture; possibly this position may not be theoretically the most correct, but it is a very good general rule to go by, and one easily remembered. It is a mistake to fancy that all portrait combinations require the stop to be placed exactly in the middle, between the two lenses. Portrait combinations by different makers require the stop to be placed at a different position, and this is frequently some point before the front lens. Putting it invariably *between* the lenses is a very Procrustean philosophy.]

ECONOMISING WATER IN OUT-DOOR PHOTOGRAPHY.

DEAR SIR,—I feel confidence in bringing the following formula under the notice of your numerous readers, as it has given me most perfect and certain results. I use a portable tent; it is quite large enough to work in, and will pack inside a 9 × 7 camera; in addition to which I take with me a 9 × 7 water-tight bath, holding 16 ounces of a 40-grain solution, 3 ounces of collodion, 5 ounces of developer, 12 ounces of syrup, and a light wooden bath to dip the plates in after development; also a plate box containing 7 plates 9×7. On arriving at the intended spot, the cover is thrown over the camera stand to form the tent, the camera then screwed on, and the view focussed. A small box which contains the chemicals, serves also as a seat for the operator inside. The plate is then coated with any good collodion, and, after exposure, developed with

Proto-sulphate of iron	20 grains.
Citric acid	½ "
Nitrate of potassa	15 "
Alcohol	30 drops.
Water	1 ounce.

When the details are fully brought out, the plate is drained on the ground for a few seconds, then dipped in the wooden bath; this is made the depth of the plate, so that no dipper is required; the bath is filled with syrup made thus:—

Brown sugar	1 ounce.
Water	2½ "
Beaufoy's acetic acid	1 drachm.
Honey	1½ "

This syrup will keep the plate moist till it is brought home, then it is washed and cleared, and redeveloped with pyro., and a small quantity of silver solution. The syrup has the double effect of keeping the film firm on the glass, and, under the influence of the pyrogallic, giving greater intensity. The time occupied in getting the negative will be only a few minutes, and the extra luggage to carry, a mere nothing.—Yours truly, THOMAS GULLIVER.

Swansea.

TO HOLD THE SENSITIVE CALOTYPE PAPER IN THE DARK SLIDE.

SIR,—I have read with great care your instructions in the "Calotype Process." I have laboured at many works in the hope of becoming expert at all the paper processes; but, to this moment, I am wholly at a loss to know how, when I have made any or all of these prepared papers, I can contrive to take a picture with them in the camera. None of the able narratives I have read consider so simple a matter worth mentioning. Suppose I cut the paper to the size of one of the glasses used for the slide, and insert this paper as I do the glass, the spring of the shutter will press it forwards. If I put a glass before or behind the paper, I fear it will be wrinkled; perhaps there should be a glass before, and one behind the paper to keep it smooth, but my slide will hold no more than one glass. Will you be so obliging as to say what is *the orthodox way* of doing that which, to every one else, must be very simple and very natural, although a puzzle to—Yours, &c. IGNORAMUS.

[The most usual way to place the sensitive paper in the dark slide of the camera is, to put it between two glasses; but, in our correspondent's case, this plan is inadmissible, both because the space is not sufficient, and also because the sensitive surface would not be in the correct focus. The paper must be in *front* of a piece of glass, similar to a film of collodion, and there are two ways of effecting this. The paper may be used *wet*, and, having been cut rather smaller, the back of it may be simply stuck to the glass by the adhesion of the two wet surfaces, either with or without the interposition of a piece of wet blotting paper; or, if the paper be used dry, it may be cut larger than the glass plate, and then, having placed the paper face downwards on a clean pad of blotting paper, lay the glass on it, and turn over the edges of the paper to the back of the glass, where fasten them with cement; in either case the glass holding the paper is to be inserted on the platē-holder as if it were a collodion plate; (a piece of warm wax will be found to answer very well.)]

TO TRANSFER GLASS POSITIVES TO GLAZED LEATHER.

Sir,—Perhaps the following method of transferring positive pictures on glass to patent leather, &c., may be useful to some of your numerous readers. I have practised it myself for some time, and find it to answer exceedingly well. First, take some positive collodion, and thicken it with gun cotton until it will barely run over the plate, develop, and fix in the usual way, taking care that the picture is well washed; put into a dish or plate 1 ounce of common water, and 6 or 8 drops of oil of vitriol, put your picture into this, and work the dish backwards and forwards until you gently loosen the film; then take it out, lay your leather on to the collodion, carefully commencing at the bottom, and working the air bubbles out; then quickly raise one corner of the leather, and strip evenly off, and, if properly managed, the picture is perfect, and permanent. To prevent curling up when drying, I tie the leather round a large bottle. Hoping that you may have every success in your new field of labour, believe me, yours, &c., E. H.

BROWN PAPER BACKGROUND.

Sir,—I have perceived in the "Photographic News" several communications on the subject of backgrounds.

I can recommend, both for cheapness and excellence, common brown paper, strained on a wooden frame. It may be obtained in continuous lengths, five or six feet in width. By arranging the frame on which it is strained behind the sitter, either vertically, or at an acute or obtuse angle with the ground, any tint may be produced, according to the degree of light falling on the surface. It is well to damp the paper before straining it on the frame, in order that, by its subsequent contraction, it may present an even surface; otherwise, in damp weather it will be inclined to give, and form puckers. W. F. W.

STOPPING OUT THE SKIES OF PAPER NEGATIVES.

Sir,—Your correspondent, W. M., asks, whether he can obtain a dark vehicle for stopping out the skies, &c., on waxed paper negatives. I find the moist lamp-black (water colour) sold in tubes to answer well for this purpose. It is improved by having a little Indian yellow mixed with it, and should not be too much diluted, as it works better when moderately thick. If the negative is slightly damped, by placing it, for a short time, in a sheet of wetted blotting paper, it will take the colour readily. The Indian yellow *alone* may also be used to improve any portions of the negative that print too darkly for the general effect.

Croydon. Aliquis.

ANSWERS TO MINOR QUERIES.

Precipitate on Diluting a Silver Bath.—*W. B. N. C.* has added distilled water to his nitrate of silver bath, and finds it throws down a precipitate; this, he concludes, arises from the distilled water not having been pure, but containing chlorides. On adding crystals of nitrate of silver to the turbid bath, he is surprised to find that the precipitate dissolves, and the bath becomes clear. Queries:—Can the precipitate have been chloride of silver, as this substance is stated to be *insoluble*, and will the bath be injured? Our correspondent has fallen into an error which not only photographers, but experienced chemists, sometimes make. It is not generally known that chloride, bromide, or iodide of silver, although insoluble in water, is capable of dissolving to a considerable extent in water containing nitrate of silver, the quantity dissolved increasing with the amount of nitrate present. Supposing a solution of nitrate of silver of a certain strength be taken, and this saturated with any or all of the above mentioned silver salts, the addition of water will, *by weakening the solvent power* of the nitrate of silver, cause a precipitation of the dissolved chloride, bromide, or iodide. Frequently chemists accuse distilled water of containing chlorides, because a precipitate is formed on testing it with nitrate of silver solution, when the fault lies in the latter. In our correspondent's case the addition of water to the bath has caused the precipitation of the iodide of silver with which it had become saturated. When, however, the fresh crystals of nitrate of silver were added, the bath became again of its original strength, regained its solvent power on the iodide of silver, and the precipitate re-dissolved.

Focal length of Compound Eyeglasses, and Magnifying Power of Telescopes.—*T. C.* wishes to know how to find out the magnifying power of a compound eyeglass, and also a telescope, the focal lengths of the constituent lenses being known. To find the focal length of a compound lens of the Huygenian or *negative* construction, divide twice the product of the focal lengths of the lenses which compose it by their sum: thus, if the focal lengths of the field and eye-glasses are 3 and 1, that of the equivalent lens is equal to $\frac{2 \times 3 \times 1}{4} = 1\frac{1}{2}$. To find the focal length of a Ramsden's or *positive* eye-piece, divide the product of the focal lengths of the lenses composing it by their sum, less the distance between the lenses: thus, if the focal length of each lens be 1·5 inch, and the distance between them 1 inch, it will be $\frac{1 \cdot 5 \times 1 \cdot 5}{3 - 1} = \frac{2 \cdot 25}{2} = 1 \cdot 125 = 1\frac{1}{8}$ nearly. The magnifying power of a telescope is found by dividing the focal length of the object-glass by that of the eye-glass.

Aceto-nitrate of Silver for Printing Purposes.—*Barium* has a quantity of aceto-nitrate of silver which has been used for the albumen process, and now, having no further use for it in that way, asks whether it can be used for printing. If carbonate of soda be added until a slight precipitate is formed, which will not dissolve on agitation, and then, after filtering, a few drops of acetic acid be used, it will do for exciting positive paper, provided the solution have the proper number of grains of nitrate per ounce of water: if it be below 60 or 80 grains, add more. *Barium* also asks if a collodion plate which has been developed in a dark tent can be brought with safety into the open air to be fixed. If the developing solution be washed off with water, this may be done without danger; but if any developing solution remain on the surface, there will be danger of a deposit over the surface. [For the other query, see *Accelerating Agents* in our dictionary.]

Enlarged Positives.—*G. S.* inquires if enlarged positives can be printed from small negatives by means of a quarter plate double combination, either by a copying camera, or by placing the ordinary camera against a hole in the shutter of a darkened room and receiving the magnified image on a screen or stand to hold the paper. Also what preparation of paper would be most suitable. The plan mentioned above will answer if properly carried out. The portrait lens should be *reversed*, and the *cap* end placed next to the sensitive paper at several feet off, and the other end opposite the small negative at a distance a little greater than the focal length of the lens. A strong light (sunlight by preference) should shine through the negative, and no other light must find its way into the room. The focussing may be easily managed by varying the distance of the lens from the negative. The calotype process, as given by Θ in recent

numbers of the "News," will be best adapted to the purpose of copying in this way.

Pictures on White China.—*J. W.* The pictures are collodion transmitted *positives*, which have been either taken in a copying camera from a negative, or else printed from a negative by superposition. Blackening afterwards, by perchloride of mercury and then ammonia, improves them.

Particulars for Building a Glass Room.—*Chemicus* is going to build a glass room, &c., and wishes for information on the subject. So much depends upon the space of ground that may be covered, the scale of operations intended to be carried on, and the length of the operator's purse, that we can only give very general hints on the above subject. In our "Catechism" will shortly appear as much instruction on this subject as will be generally useful to our readers.

TO CORRESPONDENTS.

*** *An important letter from Sir J. F. W. Herschel, "On the Photographic Properties of a New Metallic Element—Junonium," will appear in our next week's number.*

Z.—*Plain* paper is used for floating on the albumen and salt.

R. D.—The photograph you have sent is a very good specimen of the process. We do not think your charges too high.

An Aquatint Engraver.—Your first queries have already been fully answered. Tone first, then fix.

H. D.—The piece of paper inclosed is iodised *waxed paper*, and is totally unfit, therefore, for the calotype process.

Nit. Sil.—We much regret that you should have been so deceived, but we cannot say more. It is not possible that we can be always answerable for advertisers keeping faith with the words of their advertisements. We are much obliged for the formula, and have made use of it in another part of the "News." Your other queries have been recently answered.

H. C.—We regret we cannot furnish you with the particulars.

J. C. L.—We thank you for the formula, but do not see how it would apply to *acid* stains.

A Young Amateur, Glamorganshire.—If you favour us with an addressed envelope, we will forward the desired information.

L. L. B. Cantab.—Portrait combinations stopped down will give equally good relief in a twin stereoscopic camera as a pair of single lenses. The former letter alluded to not received. Thanks for the extract.

T. Clark.—We are obliged for your information. In our next number, however, will be given a long article on the subject of Fothergill's process.

R. W. F.—1. Some apparatus is made for 5¼ × 3¼ stereoscopic plates; we are not in favour, however, of a departure from the usual 6¾ × 3¼ size. 2. Ground glass. 3. Already answered. 4. No definite distance; we prefer only a few inches.

J. Ascough.—Powder the amber finely; and the chloroform will, in a few days, dissolve as much as will be necessary.

W. M.—1 and 2. The plan you mention, if properly followed out, will wash your pictures enough. 3. No good process.

Chemicus.—1. Already answered. 2. Very unsatisfactory. 3. The plan has been suggested, tried, patented, and given up a year or two ago. It will not answer well in practice.

A. B., Dumfermline.—They are very bad, if they will do no better than you state.

G. B.—It will not keep many days, even in the dark, if it contains silver.

Young Amateur.—See a note on stopping out the skies of paper negatives in the present number.

J. A. L.—Some hypo. has accidentally got on to the paper before exposure. We reciprocate your kind wish.

C. J. P.—We fear we cannot do as you wish.

C. P. and H. C. had better advertise in our columns.

A Subscriber.—The stop is for the purpose of confining the action of the *centre* of the lens to the *centre* of the picture, and the *edge* of the lens to the *outer parts* of the picture; consequently, if the diameter of the lens be not in proper relation to the focal length, the outer parts of the picture will suffer.

J. W., Edinburgh.—We are much obliged for your kind information. We cannot believe what report says, but "seeing is believing;" we have written for information to the artist himself, and shall be pleased to see some specimens.

O. X.—1. Add 2 drachms of old collodion; shake well, and filter. 2. Carbonate of soda.

S. T. B.—We have already heard of it; and hope to give particulars in our next.

C. L.—No; excepting for astronomical purposes.

Toujours Propice.—1. Yes; if the lens be good, and have a small stop. 2. Yes; we may, however, give our own; but cannot say that it will be best for beginners. 3. Already answered.

T. F.—The process referred to is identical with M. Haudoy's, to appear in our next.

Daguerreotype.—Try the formula at page 33. We should like the details of your process.

Harry.—1. The *film* of collodion ought always to be transparent; but you cannot make the *deposit* so by varnishing. 2. Add chloride of gold.

Lignum.—Our "Catechism" will be your best guide. Your optical difficulties will be perhaps solved in the articles which will appear from time to time in our pages, signed V.

H. T. T.—Has your collodion properly settled?

E. M.—It would be impossible to give, in the space at our disposal, the requisite information to enable amateurs to grind and construct their own achromatic lenses.

Perseverance.—There is no really practical process known for taking direct positives on paper in the camera.

A. Y. Z.—The daguerrotype process is so little used now, that we doubt if a series of articles on it would be of any interest to the bulk of our readers.

A. G. G.—1. For negatives. 2. The usual one. 3. Yes, if a small stop be placed in front. 4. Already answered.

B. R. M.—The principal requisites for instantaneous pictures are good light, good lens, and ordinarily good chemicals. We had the two first in perfection, and with glycyrrhizine in the bath and nearly colourless collodion, no conjuring was required to take a picture of rapidly-moving objects.

Pyrogal. Acid.—1. An excellent paper on printing, from the pen of our talented correspondent Θ, will appear in an early number — till then try the formula given at p. 33. A small rolling mill can be purchased for about £5.

Captain R.A.—1. To un-iodised collodion. 2. No plan is known sufficiently *simple* and *certain* for beginners to use with advantage.

W. Daking.—We will give your letter serious consideration, but cannot say whether we can yet open our columns to such a subject.

J. Crabtree.—Use marine glue as a cement, and varnish with spirit varnish.

Inquirer.—They are all for the negative process. A good lens is, however, the best accelerator.

J. B.—Hypo.—Q. R.—Q. E. D.—Thomas.—A Subscriber.—Another Subscriber.—E. F.—Silver.—S. P.—Lux, F.—Our correspondents will see that it is out of our power to save them the trouble which is indispensable in mastering the principles of any science.

Communications declined with thanks:—J. B.—Potass. Cyanide.—J. J. Opie.—F. W.—A. F. P.—Pyro.—T. G. C.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—D. E.—C. B.—Photo.—S. A.—A Seeker of Knowledge.—J. T.—Amateur and Subscriber.—H. M.—A regular Subscriber.—In a Fix.—L. L. K.—X. Y. Z.—Uncle Tom.—Achromatic.—Positive.

In Type.—R. G. S.—J. L. S.—Θ.—A. Keene.—Earnest.—F. W. B.—Sir J. F. W. H.—A. Molson.—M. Haudoy.—T. Reid.—J. Heywood.—C. B.—J. B.—An F.C.S.—R. W. H.—S. M.—W. D.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 8.—*October* 29, 1858.

ON OBTAINING STEREOSCOPIC PICTURES FROM FLAT SURFACES.

THE *Times* recently surprised its readers by the announcement that Mr. Sang, of Kirkaldy, had succeeded in obtaining stereoscopic pictures from flat surfaces, a thing which, it says, had been hitherto considered impossible. If this were so, we conceive that the impossibility was assumed, for we are not aware that any attempt to accomplish this result had been made until Mr. Sang brought his ingenuity into play for the purpose. The subject of the stereograms, with which that gentleman has favoured us, is the well-known series of etchings, "The Bottle; or, the Drunkard's Progress," by Mr. George Cruikshank, to whom these reproductions are dedicated. The subject is sufficiently lugubrious, and not particularly well adapted for the stereoscope, inasmuch as the class of persons who purchase these pictures are not, as a rule, addicted to what are termed, no doubt ironically, the pleasures of the bottle, and are, therefore, not in need of the lessons conveyed in these etchings. This, however, is a mere matter of taste, the point of consideration now before us being Mr. Sang's discovery of adapting flat pictures to the stereoscope; and this, we must admit, he has to a certain extent succeeded in accomplishing: we say "to a certain extent" advisedly, for though the figures themselves are seen in relief in the stereoscope, they individually lack that rotundity which is observable in stereograms of objects taken in the ordinary way.

This appearance of flatness appears to us to be inevitable from the nature of the subject. The rumours of the accomplishment of this desideratum at once set us to work, and the specimens which were forwarded to us had not long been in our possession before we succeeded in imitating their effect with perfect accuracy. Of course it is not in our power to state that we are in possession of the exact plan which Mr. Sang employs for obtaining the stereoscopic effect, but we lay the following method before our readers as being one which has enabled us to produce similar effects of factitious stereoscopic relief.

Let our readers take a stereoscopic slide in which there are objects in different planes, and which have, consequently, different degrees of relief. It will be seen, after a little scrutiny, that objects in the foreground occupy in each picture slightly different positions with respect to distant objects; being in the two pictures displaced laterally towards each other. On examining one of the "Bottle" series in the same way, it will easily be seen that this same difference of position of the figures is observable in the two halves of the slide; the right-hand picture showing more background on the right side of the figures, and the left-hand picture more on the left side of the figures. Now it is very evident that, from whatever point of view we look at an etching or engraving, we cannot see a bit more behind any of the prominent figures than the artist has permitted us to see; consequently, as these stereograms *are* from etchings, and we *can* see more of the background in one than in the other, some alteration or tampering with the original print has taken place. If the left picture be a true copy of the etching, no camera could see it as shown at the right of the slide, where the prominent figures are laterally displaced; they could not move sideways of their own accord, and, therefore, somebody has assisted them. But if an etching be taken, and one of the prominent figures be cut out of it, and then placed a little to the left of its original position, it will conceal part of the background on one side of it, but, at the same time, leave a very ugly hole in the paper on the other side; this may be filled up with white paper, and, by careful management, the missing background drawn with a fine pen, dipped in Indian ink.

Let us now test the truth of the above supposition, by a scrutiny of the remarkable slides before us. One half of each slide has, according to the above, been photographed direct from the original etching, and the other half from another etching, in which the figures intended to be in relief have been cut out, moved sideways to a greater or less extent, according to the degree of relief required, and the space which has thereby been left vacant, filled up by hand with a continuation of the background. Which of the two halves is copied from the original picture, the right or left? On examining the slides carefully with a microscope, the edges of all objects in the right half appear perfectly sharp and crisp, whilst those in the left-hand picture show evident signs of woolliness, more so, however, on the outer than the inner side of the figures. So far, so good; the right half of each slide is "the bottle" unsophisticated, whilst the figures in the left half have been cut out, and moved sideways. If so, further scrutiny should show the space formerly occupied by the displaced figure, and now occupied by the pen and ink background. This alteration is evident in all the slides, but more so in some than in others; in No. 1, the position formerly occupied by the left-hand corner of the table cloth in the left picture is clearly to be traced. In that affecting slide where the youngest child is lying in its coffin, the same thing is observable in the outline of the mourning sister and the head of the coffin. A curious effect is perceptible in No. 3, on its being placed in the stereoscope; the figure of the little girl, which, to the naked eye, appears to be standing behind her mother's chair, with her hand resting on the back of it, is thrown so far in the background, that the connection between her body and her hand is entirely cut off. In No. 6, where the drunken wretch is striking his poor wife, the faint outlines, both of himself and that of the overturned table, are clearly to be traced about a thirtieth of an inch to the left of the figures in the left half of the slide. In No. 7, in which the ingenuity and patience of the artist must have been taxed to the utmost, and in the terribly true closing scene, the same phantom outlines may be traced running down the left sides of the figures; indeed, in the specimens before us, the traces of *doctoring*, in No. 8, are so evident, that we can scarcely imagine any one not seeing at a glance how it has been tampered with.

We have not only arrived by induction at the probable method by which this remarkable series was produced, but we have, by putting our theory to the test of practice, proved conclusively that such a *pseudo*-stereoscopic effect can easily be produced by the above means. Many things of minor detail of course must be attended to in order to obtain the best results: for instance the figure must not be moved in a parallel direction, but must form an angle with its first position, the feet remaining on the same spot of the floor as at first, and the rest of the figure being moved through a very small angle round these as a centre, otherwise the figures would not appear to stand upright on the ground; the floor likewise must undergo a rather difficult process of doctoring, in order to make the lines of board in the left-hand picture form that angle with those lines in the right-hand picture, which is necessary to the illusion of its being flat. These and other little matters can be easily found out by trial,

provided the experimentalist has a true knowledge of the principles which give rise to the illusion of relief in the stereoscope.

Having thus shown how this curious effect *can* be produced (indeed, if our induction be logical, how Mr. Sang *has* produced it), we must give full credit to that gentleman for the great ingenuity he has shown in thus bringing (however imperfectly) the world of the painter and engraver into the domain of the stereoscope.

SIR J. F. W. HERSCHEL ON THE PHOTOGRAPHIC PROPERTIES OF JUNONIUM—A NEW METALLIC ELEMENT.

It is no uncommon thing for those who have no knowledge of photography, beyond a general acquaintance with the manipulatory part of the art, to speak of it as a mere mechanical process. It is not our intention in this place to enter into a defence of the science; but we would call the attention of those writers to the important scientific results to which it has just led, when directed by the powerful intellect of the writer of the subjoined letter. Our readers must have been struck with the importance of the discovery hinted at in the concluding paragraph of Sir John Herschel's address to the chemical section of the British Association, which we reported at vol. i. p. 49, in which the learned speaker mentions the great value of photography as a chemical test, in affording evidence of the "presence, in certain solutions, of a peculiar metal—having many of the characters of arsenic, but differing from it in others, and strikingly contrasted with it in its powerful photographic properties, which are of singular intensity—surpassing iodine, and almost equalling bromine."

The grandeur of such a discovery impressed us no less as photographers than as chemists; and we immediately wrote to Sir John Herschel on the subject, and promptly received an answer, from which we have great pleasure in laying the subjoined extracts before our readers.

"*Collingwood*, *October* 13*th*, 1858.

"Sir,

. . . .

"I inclose specimens of paper prepared with a solution containing "junonium" (the presumed nondescript metallic body to which allusion is made in the address you have quoted) and nitrate of silver, as also specimens similarly prepared with hydriodate and hydrobromate of potash, binarseniate of potash, arsenite of soda, and with nitrate of silver alone, and which have been all exposed simultaneously, over half their extent 60″ to the general diffused light of a very dark cloudy day. You will perceive the great difference of the action between the paper prepared with junoniate of soda and those prepared with arsenic.

"I have nowhere yet described the metal which, when satisfactorily insulated, I propose to call junonium (and which is only one of a group of metals under investigation, to which, provisionally, I have attached the names of junonium, vestium, neptunium, astæum, and hebeium—supposing the characters, by which they appear to me to differ from others already known, to be satisfactorily made out); and I am therefore unable to comply with your request that I will refer you to some published account of it.

"May I be allowed to add, that the process described by M. Bischoff (read to the Soc. Vaudoise des Sciences Naturelles, and printed in the bulletin of that society, No. 42, tom. v.), for procuring impressions in Prussian blue, differs in no respect from the cyanotype processes described in Arts. 210, 223, of my paper on photography, in *Phil. Trans. R. S.*, 1842, except in the substitution of the peroxalate of iron for the ammonio-citrate—a change, as it appears, for the worse. I annex a negative, obtained by a careful following out of Signor Venanzio G. Sella's process, described in the "Memoirs of the Acad. Sci. of Turin," tom. xvii., new series, p. cliii.: it is not very satisfactory, force being wanting; but the object of the process (to dispense with silver and avoid fading out) is so important that I would recommend it for further trial and improvement.

"I am, sir, your obedient servant,

"J. F. W. Herschel."

With respect to the specimens of paper, we may observe that so great is the sensitiveness of the junoniate of soda that, while the paper prepared with the nitrate of silver alone offers scarcely a trace of the luminous action, that prepared with the former substance is of a deep, rich chocolate colour, far exceeding in intensity that prepared with iodide of potassium, and quite equalling the bromide of potassium paper. We have been favoured by Sir J. Herschel with a small quantity of junoniate of soda, and we are at present occupied in an examination of the action of the various colours of the solar spectrum upon junoniate of silver; its remarkable sensitiveness to light renders this an inquiry of much importance and interest. We shall have great pleasure in communicating the results of our experiment to our readers in a future number.

POSITIVE PRINTING.

Of all the branches of photography, none seems to be made the subject of less study by the beginner than this; yet, if the operator wishes to get good or first-rate pictures, there is no branch of the art to which he must pay more attention. Except a man knows it, the expense of photography is enormously increased; and this, to many, is a serious consideration. My object in this paper is to give a printing process of which the results are equal to any known method. It is economical in the silver, very quickly toned, and free from every disagreeable colour in the lights.

The process:—Float the paper upon the albumen solution, prepared with 12 grains of chloride of ammonium to each ounce; dry as usual, and excite on a silver bath 60 grains to the ounce with 4 or 5 drops of acetic acid; dry thoroughly, print deeply, and wash to free from the nitrate of silver. When ready for toning, immerse the print in 10 or 12 drops of ammonia to 6 or 8 ounces of water; let it remain in the liquid for four or five minutes, take out and wash one minute in water, then immerse in the gold bath prepared with chloride of gold 1 grain, carbonate of soda 20 or 30 grains, water 6 or 7 ounces; keep the paper moving about, and when it looks very purple (generally from three to six minutes) take out, just wash in water, and place immediately in the hyposulphite solution, which should be 1 ounce to 6 of water. Then wash as in other processes to free the print from hyposulphite.

As to the materials, every man has his own likings. I prefer Canson's paper, though it is a little longer in toning than the German papers. Marion's I never can get free from black marks—not the metallic spots, but minute dark grains all over the sheets—and I also find they will not keep. The German papers are very good, but they will not take so good a surface as Canson's, in my hands. Of the English papers I have worked but few, and those were not so satisfactory as the foreign.

When excited—if they are not dried by the fire, but left to hang in a dark room, or, better, a cellar—the papers will keep a few days, even a week, well enough; but if artificially dried, discolorisation begins immediately, even in total darkness, and in a day or two the paper is scarcely fit to use. The acetic acid, I think, serves to make the paper keep its whiteness longer than it otherwise would.

The best method of keeping the chloride of gold is to procure it in the fifteen-grain tubes, and immediately dissolve this in 15 drachms, of water; then a drachm gives 1 grain of gold, which is sufficient for four pictures 10 × 8.

Some of the advantages of using this printing process are the following:—The strength of the exciting bath need not exceed 60 grains to the ounce. It is also very sensitive and tones well. Again, the great drawback to using albumenized

paper is the yellowness which the gold toning often gives to the whites. How often do the "*Notices to Correspondents*" in the different journals advise the beginner not to use anything but plain paper on account of this difficulty! How many pictures in our best exhibitions have this defect! Some lay the blame upon the hyposulphite of soda bath being not freshly made, and a thousand other causes; but the method I have described above effectually does away with it. There is not any tendency to yellowness in the toning process—nay, however yellow and discoloured the whites are when the picture goes into the toning bath, they are effectually and perfectly whitened in it during the action of the gold. If used as above, it is utterly impossible to avoid bleaching the whites, and the resulting prints are as good and brilliant as those produced by any known process.

Then, again, time is an object to many, and here this method is again of advantage. Instead of from 30 to 60 minutes which thickly albumenised paper takes to tone in the old sel d'or bath, from 3 to 5 only are required: and lastly, as to its permanency, one of our best chemists says "that it is more *chemically correct* to tone photographs with an alkaline solution of chloride of gold, but the acid gives the best results." This I answer by a total dissent from the latter statement. The alkaline gives, *at least*, equal results; and, instead of having many refuse prints on account of yellowness, there need not be a failure, except by accidents, which are not the results of any particular process.

We have to thank our correspondent for some very beautiful specimens of the process he has so well described. They are perfectly pure and free from yellowness in the white parts, with very vigorous blacks.—Ed.

FOTHERGILL'S PROCESS.

BY MR. A. KEENE.

In reply to a paragraph in a recent impression asking for information on the "Fothergill Dry Process," I have much pleasure in sending the following, feeling convinced, both from my own experience and a very extensive correspondence with photographers in all parts of the country on the subject, that it is as yet unrivalled. The "dry process" has been pronounced, by the most competent judges—and some of whom were previously prejudiced against all dry processes—unsurpassed even by the wet, more particularly for half-tone, vigour of delineation, and the general softness of appearance.

The following essentials should always be attended to:—Perfectly clean plates; suitable collodion—neither too contractile nor too powdery; neutral bath; proper amount of washing, and, I may add, perfect drying. I always prefer soaking the plates, whether new or old, first in a rather strong solution of common washing soda, and afterwards in nitric acid diluted with about equal parts of water, putting a piece of straw, or something of the kind, between each, to prevent them coming too closely in contact. The bath should be fully 35 grains to the ounce, and made with pure nitrate of silver slightly and carefully fused, to remove all trace of free nitric acid; saturated with iodide in the usual way, and if found slightly alkaline, a drop or two of glacial acetic acid may be added to every 10 ounces. Remove all dust from the plate; coat with collodion; and when the film has *well set*, put it in the bath; after about half a minute move it up and down occasionally until the greasiness disappears—in warm weather this will be in a minute or less, and longer according as temperature is lower; remove it from the bath; and if the extreme upper end shows a slight transparency compared with other parts, the film has been sufficiently well set. Place it on a levelling stand, smaller in diameter than the width of the plate, and pour lightly on, at one corner or along the end, for a stereoscopic sized plate 4 drachms, and for 10 × 8 do. 15 drachms of filtered rain or distilled water; cause it to flow all over, from *end* to *end* and *side* to *side*—by inclining the plate by *means of the stand*—well up to the edges, *that the bath may be equally diluted on every part of it.* By bringing the eye o a level with plate, the operator is enabled to see whether the water at *once* flows over *every* part; if not, sufficient impetus must be given to the wave in that direction to cause it to do so; continue until all greasiness disappears—this requires from fifteen to thirty seconds for stereoscopic plates, according to the temperature, and about double that time for 10 × 8 size; empty off the water, and pour on sufficient albumen to coat it; this is to be prepared as follows:—white of egg 10 ounces, distilled water 8 to 10 ounces, *strong* liquor of ammonia 80 to 100 minims; agitate into a froth, and strain for use; this will keep, well corked, for a week or two; the portion required should be filtered through sponge always just prior to use. To insure its being well up to the edge, cause it to follow the finger all round the plate, taking care that the finger is perfectly clean, and rests against the under part so as not to disturb the film on the surface. After running the albumen round several times, say for about half a minute, empty it away, and place the plate in a dish containing sufficient filtered rain water to cover it to the depth of about a quarter of an inch; make the latter pass freely backwards and forwards over it for about half a minute; repeat with a second quantity; take out the plate, and pour lightly on at one corner, or along the end, sufficient water to pass all over it. Place it on one corner, on several thicknesses of blotting paper, in a chemically dark place, free from dust, to dry; after it has thus stood for about an hour, a further drying by artificial means has been found of essential service, particularly when the atmosphere is damp; for this purpose, the plates may either be placed on an ordinary water plate, filled with nearly boiling water, for a few minutes, as recommended by Mr. Prichard, or placed on a shelf in a cupboard, and a water bottle filled with boiling water placed in front of or immediately underneath them, as practised by Mr. Ebbage with great success, or by any other convenient means, care being taken that the temperature does not exceed about 140° Fahrenheit. This has been termed "film dryness," in a very excellent paper on the Fothergill process, read by a Mr. Aywood. In it he states, that not only is sensitiveness increased by this artificial drying, but that the unevenness of sensitiveness, occasionally experienced from the plate being only surface—instead of film—dry in some parts, is obviated by it. This has also been previously observed by Mr. Prichard and Mr. Ebbage. When the plates are finished, they may be placed in the dark slides or a *tin* box, but on no account in a deal one. The exposure varies so considerably, according to circumstances, that only a very general idea can be given. One of our most successful operators has been giving, for stereoscopic pictures with a single 4½ inch focus lens with a small stop, forty and fifty seconds' exposure on general average subjects. Before developing, moisten the surface of the film with distilled water; develop with

Pyrogallic acid	1 grain.
Glacial acetic bath	20 minims.
Distilled water	1 ounce.

To each drachm of this add one drop of a 33 or 35 solution of silver; continue the developing until the picture is well out, changing the solution as often as it becomes discoloured; the time required is generally from three or four to ten minutes with a high temperature, but with a low one double that time, or even more, is sometimes required.

Here, I would draw attention to an error many commit when practising this process, viz., *over*-developing, by which many excellent negatives are lost, half-tones and sharpness of detail being entirely destroyed by it, and those very objectionable contrasts obtained. If the exposure, &c., has been correct, the sky and high lights will begin to show themselves in about a minute or so after the developing solution is put on, the shadows gradually making their appearance; as soon as the former are dark and opaque, but not entirely black, and the latter well-defined, the developing may be considered complete.

Fix with hyposulphite of soda 48 to water 12 or 16. If a stronger solution than this is used, or cyanide of potassium, the negative will be injured, and film liable to curl off when dry.

I have here endeavoured, as fully as possible, to give the details of the process, and will now explain the why and wherefore of the more important parts of the operation, and commence with washing the sensitised plate. As a concentrated solution of nitrate of silver coagulates albumen, the object is to *evenly* dilute the bath on the surface of the plate to a point that does not produce this effect, at the same time going as little beyond as possible. This desideratum is arrived at by using the prescribed quantity of water in the manner directed, and will explain the necessity for the uniform dilution; for on whatever part this does not take place, the albumen is partly coagulated, and various lines and marbly stains appear on developing; if, on the other hand, more water is used, the silver left will be too little to form with the albumen a sufficiently sensitive film. It is rather a disputed point, whether albumen merely acts mechanically as a coating, or enters into combination with the nitrate of silver. My time has latterly been too fully occupied to enable me to ascertain this by direct experiments, but there are many things that cause me to consider the latter to be the case; and, taking this for granted, the process, as well as the great sensitiveness of plates prepared by it, are easily explained in the following manner:—During the formation of the iodide of silver, when the plate is in the nitrate bath, the pores of the collodion are filled with the bath; when the water is poured on for diluting that on the surface, as it is specifically lighter than the solution, it does not, in the short time it is allowed to remain on unite with or dilute the portion in the pores; but when albumen is poured on, of a density near or equal to the silver solution, and the latter also having an affinity for it, union takes place, and the whole pores are filled with a coagulated sensitive compound, which is not disturbed by the gentle washing used for removing the albumen in excess. The dark marks experienced when developing a plate that has had albumen poured on before being properly washed, after sensitising, also confirm this view of it; the coagulated sensitive compound, remaining in a thin stratum firmly on the surface, is not removed with the gentle after-washing, and so shows itself during development. It is necessary that the water used for washing should not, during any part of the process, be allowed to fall with force on any part of the plate, or a *non*-sensitive patch or patches will appear on development. It is also necessary that the hands should be perfectly free from silver solution when handling plates with albumen on them, and *vice versâ;* a good plan is to have a basin of water, and dip the fingers in, and wipe them after each part of the operation, taking the precaution to use one hand for handling the plate when the silver solution is on, and the other when albumen is on.

It must not be thought, because I have entered so fully into particulars, that the process is tedious, or difficult in manipulation. I could, if necessary, show it to be the most easy and simple of all the preservative processes, and a 10 × 8 plate has, to my knowledge, been perfectly prepared *in three minutes* from the time of taking it in hand, to placing it on end to dry.

Leamington, October 19th, 1858.

URANIUM PRINTING PROCESS.

BY M. HAUDOY.

In No. 8 of this paper a reference was made to the process of obtaining uranium proofs employed by M. Haudoy. He says:—"I prepare my paper with the gelatine and nitrate of uranium, in accordance with the instructions given by M. de la Blanchere. After exposure, I use the aceto-nitrate of silver bath used for negative proofs upon paper, for developing. The exposure to the sun varies, according to the nature of the slide, from one to ten minutes, but should be so long, that thirty to forty seconds in the bath above mentioned should make the proof complete. I then take it out, and lay it in the following bath:—

Water	100 parts.
Proto-sulphate of iron	8
Acetic acid...	2

The picture acquires great vigour in this bath, and appears, so to speak, to come out from the substance of the paper to appear on the surface. In fact, the nitrate of uranium proofs that have not undergone this reaction, are only good as transparent views—the very opposite being the case with the pictures that have been submitted to the action of the iron bath. If the exposure to the sunshine has been too prolonged, it will be necessary to wash the proof slightly on removing it from the silver bath before submitting it to the iron bath. On coming from the iron bath, the proofs have a sepia tint, more or less intense; they are darkened by means of the chloride of gold (perchloride of gold, 1, distilled water, 1000); washings must be repeated in several waters. The proofs presented to the French Society have no other object than to show the results of this process, which, better than any other, gives a faithful representation of the negative. The action of the iron bath being rather rapid, it is necessary to have a dish full of water beside it, in which to plunge the print when it has acquired sufficient vigour. This point should be a little exceeded when it is intended to submit it to the action of the chloride of gold."

Critical Notices.

A Guide to painting Photographic Portraits, &c. By A. N. Rintoul. Third Edition. London: J. Barnard, 339, Oxford-street.

The subject of tinting or colouring photographs is one which will doubtless interest the great majority of our readers, as most photographers have, at one time or other, been delighted by some choice specimen of colouring, or disgusted by an unnatural daub, in which the only thing which the painter accomplished was, to lose the resemblance.

In tinting photographs, too much caution cannot be observed in preserving the fidelity of the likeness, the one thing to which all else should be subservient; and it cannot but be a matter of regret that very *pretty* pictures, but with the fatal fault of being unlike, are everywhere to be seen, and are too often admired. As far as light and shade are concerned, the painter cannot hope to improve upon the photograph; he has only to supply that in which our art is deficient—colour, and the stone-like picture becomes life-like. These remarks are occasioned by the issue of a new edition of the above little work, containing a complete description of the different processes, viz., water colour, powder colour, oil colour, &c. The work contains directions for the preparation of the paper; for making the different tints required; for the use of the photographic water colours; a few hints on dry tinting; and brief instructions on oil painting. It is written clearly, and contains explicit directions as to the mode of procedure, from the taking of the photograph to the finishing stroke of the pencil. A series of diagrams accompany the work, showing many of the different tints required, and the shadow colours passing over them, illustrating the effect of glazing; also, the compounded flesh colours.

We must refer our readers to our advertising columns for particulars of the photographic water colours, which have been prepared as an accompaniment to this little work. The box consists of twenty-one of the most useful tints. In the case of the artist who has but little time to devote exclusively to colouring, they cannot fail to be of the highest value, as he will find ready to his hand the appropriate tints for his work, which will obviate the loss of time occasioned by

the mixture of several colours, the combination of which, also, requires experience and knowledge; and the professional colorist, though he may not find, perhaps, all the tints he requires, will find many with which he cannot easily dispense.

Photographic Chemistry.

NATURE OF THE METALS.

(*Continued.*)

Mercury is a metal which, unlike others, requires no heat to fuse it: indeed, except under artificial circumstances, we only see it in a liquid form. It can, however, be solidified by reducing it to a very low temperature—a circumstance which occurs spontaneously in Siberia in the winter, as well as in one or two other parts of the world. As a solid it may be cut with a knife, and is very slightly malleable. The temperature at which it freezes is 40° below zero, and at 660° above it it boils and evaporates. Its volatility, however, is such that on exposure to the atmosphere at ordinary temperatures it gives off vapours; as may be easily demonstrated by placing a piece of gold over mercury, in which situation it will speedily whiten, from the combination of the vapours of the mercury with the gold, for which metal it has a great affinity: so great indeed that, when combined, they can only be separated by submitting the metals to a high temperature, when the mercury is volatilised. It combines with oxygen in two portions, forming protoxide and peroxide of mercury, the latter of which, composed of 8 parts of oxygen to 100 of the metal, may be obtained by boiling it for a considerable time in contact with air or oxygen. It combines with chlorine in two proportions, the lesser combination producing the chlorine commonly known as calomel, which is formed of 18 parts of chlorine to 100 of the metal; and the other, composed of 36 parts of chlorine to 100 of the metal, producing the bichloride of mercury—generally denominated corrosive sublimate—which is used in photographic operations for whitening direct positives on glass. The principal use of mercury in photography is to develop daguerrean plates; which is accomplished by heating the mercury to a temperature of about 140°, when it gives off vapours which settle upon the plate, and the picture gradually becomes visible.

Platinum is a metal which possesses many qualities that would render it extremely useful in photographic manipulations, but its scarcity, and consequent high price, make its employment inadmissible in the way in which it would be of the most use, viz., in the formation of utensils which would be alike unaffected by heat or cold, or by almost any chemical agents, *aqua regia* excepted. Platinum, dissolved in this liquid and the solution evaporated to dryness over a gentle fire, yields a reddish brown salt in crystals; this is the bichloride of platinum—which, as it attracts moisture from the air, should be kept in a well-stoppered bottle. The bichloride of platinum is sometimes used as a substitute for the chloride of gold in toning pictures. M. de Caranza was one of the first who employed this substance for the purpose, and his method will be found described at length in the Bulletin of the French Photographic Society of 1856. There is a form of this metal which is termed spongy platinum, which, on account of its singular properties, we will describe here, although it does not bear directly on photography. It is prepared in the following manner:—A piece of platinum is dissolved in a mixture of nitric and hydrochloric acids with the assistance of heat, and to this solution is added a solution of chloride of ammonium as long as it continues to precipitate anything. The precipitate must be collected by filtering, and washed in water, and then dried in the air. A little of this powder heated in the flame of a spirit lamp becomes incandescent; it is then allowed to cool, when it can be used in the following manner:—A piece of it placed at a little distance from the orifice of a tube through which hydrogen is passed, and a jet of this gas being directed upon it, it becomes red-hot, and sets fire to the hydrogen. This may be done, with a like result, several times, but eventually the sponge ceases to be affected by it.

(*To be continued.*)

Dictionary of Photography.

Acetate of Lime,—is formed by dissolving carbonate of lime in dilute acetic acid, and evaporating. It crystallises in silky needles which are very soluble in water, and effloresce partially in the air at ordinary temperatures. This salt has been recommended by M. Le Gray, as an addition to the gallic acid bath for developing paper negatives: it causes the picture to develop very rapidly. Addition of acetate of lime to water admits of a larger quantity of gallic acid being dissolved in it. If added in too large quantities in proportion to the gallic acid, the decomposition will be too rapid, and the pictures will darken all over.

Acetate of Lead,—is prepared on the large scale by acting upon metallic lead or its oxide with vinegar. The crude product is purified by solution in water acidulated with vinegar, and crystallised. It is usually met with in commerce in the form of a confused mass of crystals resembling loaf sugar; this and the slightly sweet taste which it possesses, have given rise to its common name of sugar of lead. It dissolves freely in water, and Sir John Herschel has carefully examined the photographic properties of its solution, both in the positive and negative processes. If used strong, in conjunction with iodide of potassium and nitrate of silver in the calotype process, it has the property of increasing somewhat the sensitiveness. Further experiments however, are, necessary before it can be decided whether the advantages attending its use are not counterbalanced by other disadvantages. The addition of a small quantity to the pyrogallic acid developing solution used in the collodion process, causes the pictures to be of a purplish tinge. Mr. Hunt states that paper soaked in a solution of acetate of lead, and, when dry, washed over with a neutral solution of chloride of gold, becomes brownish-yellow, and acquires a slight though peculiar sensitiveness to light. The first action of light has rather the effect of whitening the paper by discharging the original colour, and causing it to become a pale gray tint, which by further exposure increases to a dark slate colour. If, however, it be removed from the light when not darker than a moderate ash gray, and held in a current of steam, the part acted on by the light immediately darkens to a deep purple. Immersion in boiling water has a similar effect. Acetate of lead has also been recommended as an addition to the gallic acid developing solution in the paper process, as a means of increasing the rapidity of the development; it is, however, liable to stain the paper. Acetate of lead is also used in conjunction with hyposulphite of soda to form a *colouring bath* for positives on paper; its action will be explained under that head.

Acetate of lead in conjunction with gallic acid forms one of the most powerful developing agents for collodion negatives. By its means a collodion plate which has received only half the exposure necessary to be given when pyrogallic acid is employed, may be developed

into an intense negative. The process is the invention of M. Frank, and is as follows :—

The plate, having been coated with collodion and rendered sensitive in the ordinary way, is to be exposed in the camera for about half the ordinary time of exposure ; on removing it to the dark room, pour over it a saturated solution of gallic acid in distilled water, to which a few drops of alcohol have been added, to make it flow better over the plate. Then put into the developing glass about six or eight drops of a solution of acetate of lead (strength about 30 or 40 grains to the ounce) and pour the gallic acid which is on the surface of the plate back, so as to mix the two solutions together ; these will become milky, when pour the mixture back over the plate, and the development will commence at once, and in the course of a few minutes will have attained the intensity requisite for a good negative.

(*To be continued.*)

A Catechism of Photography.

V.—THE DARK ROOM.

Q. What do photographers mean by the "dark room?"

A. They apply the term, "dark room," to the place in which most of their chemical preparations are conducted, and from which it is necessary to exclude the light.

Q. Must all light be excluded?

A. It is only necessary to exclude the chemical rays of light—namely, those whose influence would act upon the prepared surfaces used in photographic operations.

Q. How is it possible to exclude the chemical rays if light is, in any degree, admitted?

A. Light, as we have already stated, is compound, and not simple. A ray of white light not only contains seven colours, as exhibited in the solar spectrum, but contains three distinct principles—namely, heat, light, and actinism, or that principle by which chemical effects are produced. We may admit to any place the illuminating power of light, and at the same time exclude its chemical influence. This is done by making the light to pass through a medium which will not transmit the actinic rays.

Q. What medium can be employed for this purpose?

A. Orange-coloured glass. A piece of orange-coloured glass, about a foot square, will admit sufficient light for all practical purposes ; but great care must be taken that by no chink or hole white light is admitted.

Q. Would it not be equally safe, and more simple, to exclude the solar light altogether, and conduct the chemical preparations by artificial light?

A. This may be done, but it is less secure and less convenient than the plan already named. There is a certain amount of actinic influence in artificial light ; and the obscure, unsteady, and insufficient light given by a candle or lamp, is likely to occasion more trouble and annoyance ; whereas the light admitted through an orange-coloured glass is steady, and, as the eye soon becomes accustomed to the semi-obscurity which it gives to the room, the operation may be conducted with facility.

Q. What should be the dimensions of a dark room?

A. This depends almost entirely on the operator. It should neither be so small as to inconvenience his operations, nor too large to render everything readily accessible. The chief thing to be sought is, a room which will admit of your operating with freedom, arranging your materials methodically, and from which the light can be effectually excluded.

Q. Will not the light enter by the door?

A. A thick curtain, running on a rod with rings, should be placed just within the entrance, and drawn across immediately the door is closed.

Q. What other adaptation is required?

A. The room should be fitted up conveniently with a table on which the preparation may be conducted, and with shelves for the arrangement of the materials. It is best to set aside one portion of the room for the preparation of the sensitive surfaces, and another for the developing process. Method in this respect is in the highest degree desirable.

Q. Is it not necessary to have a plentiful supply of water?

A. Yes, this is very essential, especially in the developing process ; and, therefore, the part of the room chosen for that operation should be fitted with a water tap, sink, waste pipe, &c.

Q. Is the water used in the developing process, and in fixing proofs, of any subsequent use?

A. As it necessarily contains a considerable quantity of nitrate of silver, it is bad economy to throw it away ; the silver is precipitated by the reducing agents, and settles at the bottom of the vessels employed, so that it is easily removable.

Q. May the same vessels be used for different purposes?

A. Each glass, each funnel, each wash-tray, should be employed for one purpose only. And everything in your laboratory should be distinctly labelled.

Q. What apparatus is required in the dark room?

A. This, of course, depends on the process you adopt ; but earthenware dishes, or gutta-percha trays, glass funnels, measuring glasses, apothecaries' scales and weights, glass stirring rods, and a good supply of chemicals are essential. Everything must be kept in good order : all your chemicals ready to your hand, all your apparatus scrupulously clean. Photography will yield no satisfactory result to a careless or indifferent operator. The art demands the exercise of method, nicety, and cleanliness.

(*To be continued.*)

Correspondence.

PORTABLE CAMERA AND DEVELOPING BOX.*

FROM MR. T. BARRETT, REIGATE.

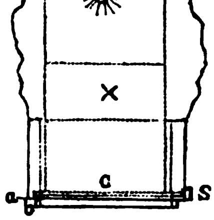


Fig. 3.

THE dark chamber Fig. 3 (section) is a box made of deal (say ¾ inch thick). The back and front pieces are 5½ inches wide, the side pieces 2 inches, and made to screw on to the ends of the back and front pieces ; all are 4 inches high, and cut out at the bottom as at *a b*, Fig. 3, so that when put together they form the projection (*b*) to fit into the cell at the top of the camera, and also to fit the baths. The flange, *a*, rests on the camera and bath box, and helps to exclude the light. Inside the box at C are deep grooves cut in the thickness of the wood for the shutter S to slide into, to exclude the light when the dark chamber is out of the camera or bath box. The centre of each side of the box (dark chamber) must have a V groove fitted corresponding with the centre of the cell in the camera, when placed in it, for the plates to slide in. Covering the box is a black silk bag lined with yellow silk, which must be long enough, beyond the top of the box, to contain the plate when it is drawn up and rests on the closed shutter S (see fig. 3). The lower edge of that part of the box which goes into the baths should be well varnished with *spirit* varnish, or covered with a thin layer of marine glue; the *grooves* also. The *modus operandi* is as follows : Having spread on the ground a square of the black glazed cloth lined with white, to keep all the apparatus

* Continued from p. 80.

in view, and to cover it in case of rain. Having taken out the plate box, I screw the camera on to the tripod stand through a hole in the case; then slide in the thin piece of wood (6), and put the piece (5) into its place, screw in the lenses and place the focusing glass through the cell in the camera, so that the back of it touches the raised back of (5). Having focussed the object, take out the glass and slide in the back shutter. Then take the baths out of the box, put the clamps into the lid, and reverse the box. The baths are then put into their respective cells, and the tops lightly put over to protect the contents from dust. Then take a plate from the plate box and sliding it into the "dark chamber" (which should have a mark on the silk to show the front), fasten it with the clip (9), the end is then pushed out of the chamber, and having been wiped quite clean, the collodion is poured on and the chamber immediately placed in the bath S. When the plate is sensitised it is drawn up and the shutter closed. Then placing it in the cut or cell in the top of the camera the plate is pushed down to touch the back of the piece (5) (which can be felt); it is then exposed, and after being drawn up, and the shutter closed, the chamber is then placed in the bath D. When the plate is developed, which should be almost immediately if the baths are in good working order, *especial* care must be taken not to draw it up again, but the clip must be removed and the chamber taken out of the bath, leaving the plate in it. If found not sufficiently developed it may be returned to the bath, resting the top against the plate to keep out dust. I find no prejudicial change takes place after development, though examined in the sunlight before fixing. The plate is then washed, fixed with the hypo., well washed, and returned to the plate box, *collodion end upwards.* If plenty of water be not at hand, the fixing may be deferred, but the developer *must* be washed off. The collodion used should have been iodised some time, as it gives denser negatives than fresh collodion; two drops of pure glycerine should be added to each ounce. The silver bath should consist of 30 grains *fused* nitrate silver to the ounce of distilled water. The bath must be saturated with iodide of silver by immersing a plate coated on both sides with freshly iodized collodion, leaving it in the bath all night. The developer 30 grains protosulphate of iron, and 4 grains citric acid to the ounce distilled water. It is most important that the silver bath should be kept strictly neutral. If at all acid the negatives will be thin and streaky. It should be tested with blue litmus paper, and if found to redden the paper, it must be neutralised by adding one minim of a saturated solution of carbonate of soda in distilled water to each ounce of the bath, or less if only slightly acid. The baths must be filtered till quite clear. Both baths should be filtered occasionally, and when going any distance, the liquids might be carried in bottles holding a couple of ounces more than required for the baths, which should not be filled for use higher than will cover the scratch across the plate, otherwise the bottom of the dark chamber would touch the liquid, which it is better it should not do. Both ends of the plate may be made available by covering the finished negative with gutta percha dissolved in benzole, care being taken not to *slide* the clip off when removing it.

PAGES FROM THE NOTE BOOK OF A TRAVELLING PHOTOGRAPHER.

SIR,—I am very glad to see that you do not exclude from the "PHOTOGRAPHIC NEWS" matter of general interest, even although it does not point out the superiority (often imaginary) of one process over another, or the relative advantages or disadvantages of the dry collodion process. Of course, as a photographer, I do not undervalue the importance of these subjects; on the contrary, it is because I find so much matter for serious reflection in the "PHOTOGRAPHIC NEWS," that it is a relief to my mind to turn to the narratives of personal experience which occasionally appear in it. Besides, it is easy to perceive that an advantage is derived from publishing these papers, apart from the mere pleasure which your readers may derive from their perusal. They encourage a man to persevere in his attempts to obtain views of beautiful scenery or monuments, under circumstances of difficulty which would, in all probability, induce him to content himself with obtaining pictures which, if they were less interesting, would have the recommendation of being more accessible, when he feels that, if he has anything to say, there is a channel open to him, by means of which he may address thousands of more or less interested people, instead of those alone, whom he meets by his own fireside.

I have myself travelled some hundreds of miles with the camera; not simply with the object of obtaining photographs, but sometimes on business which rendered the possession of the camera of great value to me; and, on other occasions, for pleasure, which was greatly heightened by the power of bringing away pictures of the more striking scenes I visited. Indeed, there are few portions of the continent with which I am not more or less familiar; and I will, with your permission, and with the assistance of my note-book, give your readers some account of a few of my wanderings. I do not imagine that they will be read with the same interest as those of your Algerine correspondent, who has the advantage of being on comparatively untrodden ground; but, on the other hand, they shall not be mere catalogues of collodions, papers, and processes. It is somewhere related of a Scotchman, that he wrote a part of a tragedy, and took it to Garrick for his opinion; who returned it to the author, and advised him not to finish it, as his talent did not lie in that way. The author took the advice, and went home and wrote the two first acts of a comedy; which he hastened to submit to Garrick, thinking that he *must* be successful this time, but was again told that his talent did not lie that way; upon which he exclaimed, in a tone of surprise,—"Why, David, didn't you tell me that my talents did not lie in tragedy?" "Yes;" replied Garrick, "but I did not say they lay in comedy." "Oh! but,—" exclaimed the Scotchman, "if they don't lie there, where the de'il do they lie, mon?" Now I do not, like the North Briton, imagine that I have any particular talent for the grave or the gay; but I merely propose to give a simple statement of what I saw and did most interesting to me, on my photographic tours.

About four years ago I supplied myself with an ample stock of necessaries for all photographic purposes, and left England, with the ultimate intention of going to Hungary; but, with ample time at my disposal, to visit any places of interest on the road. My first photographs were made at Bruges; almost every street of which contains a building or buildings capable of tempting one to pitch the camera. It has also the advantage of possessing a number of idle vagabonds, who swarm about you at the railway station, and insist upon showing you the town, and who can easily be made available for transporting the materials requisite to enable you to gratify the temptation. I would, however, advise any photographer who may follow my example, to adopt the same precautions to guarantee the safety of their solutions as I did. I had every bottle carefully cased in gutta percha, rising nearly level with the top of the bottle, and with a sliding cover of the same material, both of a sufficient thickness to preserve the bottles from damage, whether tossing about in a railway carrage, or in the careless hands of a porter; and, even in the event of a bottle being broken, little, if any, of the solution could escape.

The whole of the bottles, camera, &c., fitted closely into a strong leather case, like a portmanteau, with straps, by means of which it could be fastened to the back of a mule, or fitted to a man's shoulders. I may here remark, that nothing is so likely to cause vexation to a man who proposes to make a photographic tour in unfrequented parts of the continent as the possession of one of those so called portable cameras, so limited in its capacity that an accident to one of the bottles (irreparable in such a case) may effectually destroy all possibility of his carrying out his intention. After all, the portability is only a question of degree; if you

carry it yourself it becomes heavy before you have gone half a mile, and if you hire a man to carry it for you, it may just as well be ten pounds heavier. Certainly where a man is in the habit of "taking his camera in his hand, and sallying forth in search of the picturesque," as a recent photographic publication has it, it becomes an object of importance to reduce the weight of the apparatus as far as possible; but this appears to me a very unsatisfactory mode of proceeding. The plan I have almost always adopted has been, to visit the neighbourhood of the hotel or inn where I have been staying, and mark the spots which interested me most; and then one day with the camera has generally enabled me to get all the views worth having; and, as I generally hired a horse to carry my apparatus, I have been able, by starting very early in the morning, to take views nearly twenty miles apart on the same day. Another advantage attending this plan was, that I knew exactly where water was to be found; which, as I almost invariably use wet collodion, some advantage.

I dare say most travelling photographers have adopted a similar contrivance for carrying water under similar circumstances; but, in case any of your readers may not, I will just mention that, before leaving England I got made for me a strong waterproof bag, or rather bottle, capable of holding a gallon of water; a narrow strap round the mouth effectually prevented the escape of the liquid, and a second strap and buckle served to suspend it. In this way I could either take enough water to last me all day; or just sufficient to serve until I reached a spot where I could obtain a fresh supply. Perhaps, while on the subject, I may as well say that my tent is one of my own invention; and is, in my opinion, infinitely better than those in general use. In the first place, I abandoned the tripod, and instead thereof, I substituted an upright hollow cylinder of brass, jointed like a fishing rod, with the exception of the second joint, which works up and down like the tube of a telescope, and is fixed at any height by means of a screw. The bottom joint was furnished with a spike about five inches long, for thrusting in the ground; and the top joint had five thin iron arms, projecting at right angles from its summit when in use, but which could be lowered, precisely in the same manner as an umbrella, when not in use. From the sides of two of these arms there hung two flat pieces of iron, about half an inch in width, the bottoms of which were curved at right angles, so as to slide under two flat staples at the sides of the camera, which was thus held in a perfectly firm and immoveable position.* The tent covering was a voluminous mackintosh wrapper, lined throughout with a light yellow woollen material. When I used it as a wrapper, the lower part was looped up, but when I used it as a tent, this was let down, and fastened to the ground by thin steel pegs attached to the tent, about four inches from the bottom. The advantages of this tent were, lightness, the facility with which it could be put together, its usefulness when not in use as a tent, and its greater capaciousness when in use as such. I have spent in it, in company of two friends, many hours thoroughly protected from the rain, which was descending in torrents; and perhaps some who read these lines may remember when they, four in number, were indebted to a photographer's tent, in the lower Pyrenees, for two hours' shelter from a storm, which would have drenched them to the skin in two minutes. On more than one occasion I have spent the night in it, from preference; in order to avoid the nasty, close-smelling, vermin-haunted bedroom of an Italian road-side public-house. Nor is it vermin alone one has to dread in these places; I slept, quite recently, in a room at an inn where a guest had first stabbed the landlord, and then thrown his body out of window. The occurrence was a strange one. The guest had been drinking freely, and had foolishly shown a considerable sum of money he had in his possession; which so excited the cupidity of the landlord, that he arranged with his son to murder him, and throw his body out of window; the son's share in the transaction was to be limited to the digging the grave, and burying the body. From some cause or other the intended victim became suspicious of evil designs on the part of his host, and determined on going to bed without undressing. About midnight he woke out of a light doze, and saw a dark figure stealing towards his bedside, in whose hand he could distinguish the glimmering of what he took to be a knife. Without waiting to be attacked, he sprang from the bed upon the would-be assassin, wrenched the dagger from his hand, and, without a word being uttered by either of them, the landlord sunk to the ground, stabbed to the heart with his own weapon. Fearful that there might be others not far off waiting to assist in his removal, the guest crept quietly to the window, and opened it, with the intention of dropping down and making his escape; but the moment he opened the window, he heard a man who was beneath it tell him to make haste and throw the body out, as the grave was quite ready. Taking the hint, he went to the bed, drew the sheets off, and wrapped the dead body of the landlord in them very carefully, and then lowered it out of window into the arms of the son. His next step was to walk quietly to the street door and let himself out, and then to hasten to the police station, where he related what had happened, and was accompanied back to the inn by a party of the police, who found the son in the very act of throwing the dirt in the hole upon his own father's body. He was compelled to dig the body out, and was directed to open the sheets; when, to his horror and consternation, he found that he had got the wrong man. He confessed the plot at once, but had not been hanged when I was there. Accidents of this sort are rare, as far as we know; but when we consider how many families there are, one of whose members has disappeared, and been no more heard of, the thought naturally suggests itself—what has become of them? I would therefore advise any photographer who proposes making a solitary trip to an unfrequented part of the continent, to provide himself with a revolver as a means of protection. It occupies little space, and is "material guarantee" for the safety of one's property. I have never found it necessary yet to make use of mine; and, indeed, I am afraid that whatever danger I was in, I should not have the heart to take the life of a fellow-creature. It is possible, though, that the sight of it may have saved me from the necessity of using it, for when I have found myself in a solitary glen, I have always displayed it conspicuously to any ruffianly-looking fellow I may have observed approaching; and I have met with a few under such circumstances. Such risks as these, however, are not worth a thought, in comparison with the pleasure to be derived from visiting foreign countries with the camera. Some of the happiest hours of my life have been owing to my travelling with that instrument. It has been a passport to many a drawing-room in country houses, which, otherwise, I should never have seen; and on no occasion when I have desired to take a view of an antique château, and have sent in my card to the proprietor with a polite request to that effect, have I been refused; and, no doubt, my experience resembles that of other photographers among my countrymen. In these cases it is an advantage to be alone, and a foreigner.

VIATOR.

* We may possibly misunderstand the above description of our correspondent's camera-stand, but it seems to us a rather shaky concern, and unworthy of VIATOR's usual ingenuity.

THE "PARFAIT" STEREOSCOPE.—We have recently had submitted to us a stereoscope bearing the above title; and though, in these days of progress, it would be rather rash for us to say that it really is perfect, yet it so far surpasses any that we have seen in the matter of portability and compactness, that we have no hesitation in pronouncing it to be the best in those respects yet invented: for more complete particulars we must refer to the advertisement in another part of our paper.

THE *Daily News* announces that Nadar, the well-known French photographer, is about to take a bird's-eye view of Paris from a balloon, by means of the camera.

Photographic Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION, MYDDELTON HALL, ISLINGTON.—WEDNESDAY, OCTOBER 27TH, 1858.

MR. BARBER read a paper "On the Causes of Failure in the Oxymel Process." He used three vertical baths—one for the nitrate, another for the washing, and another for the oxymel; and in the last only he traced a failure. In one case, it contained iron, producing a misty, foggy development, which might be increased in intensity to any amount; but the picture remained, as it were, buried beneath it. Whether that emanated from impurity in the charcoal used for bleaching the honey, or was contained in the gutta percha of the nitrate bath, he failed to discover, though he discovered an excrescence of metallic silver on one part of the nitrate bath; thus proving the presence of a base metal. By both changing the bath and abolishing the use of charcoal, he got over that difficulty. The ordinary source of iron in the oxymel arises, Mr. Barber says, from making it in an iron boiler imperfectly tinned. Mr. B.'s method is first to mix some chalk with water, then add it to the honey, and boil; after which turn it into a deep vessel, and when cold, pour off from the grosser sediment. Again heated and clarified with white of eggs, it will run rapidly and brightly through a strainer or paper filter; after which, it is converted into oxymel by the addition of acetic acid. Almost every sample of honey gives an acid re-action to test-paper, probably derived, in the first instance, from the fumes of sulphur used in the destruction of the bees. The object for adding the chalk is to neutralise this, and prevent its attacking the apparatus in which it is made; it is also of importance in brightening the product. The slightest trace of iron is highly detrimental. In another case, his oxymel bath contained nitric acid. In the spring of this year he took a few pictures quite equal to any he expected to obtain from a preservative process. After three or four months, he found that with the same oxymel he could get no density, and only a plate with unmistakeable nitric acid symptoms. In spite of the washing, some nitrate of silver will find its way into the oxymel bath; and it being a property of nitrate of silver, in contact with light and organic matter, to become reduced, it was evident that operation had been going on, for his honey had become much darkened in colour; consequently, an equivalent of nitric acid must at the same time have been liberated, or entered into some other molecular arrangement productive of the same effect. He neutralised that by dissolving some chalk in acetic acid, adding the resulting acetate of lime, which completely righted it. Probably acetate of magnesia would be a better addition, it being a more deliquescent salt. Any alkaline acetate may be employed for the purpose; the nitric acid of course unites with the base, setting free the acetic acid. Mr. Barber produced several pictures in illustration of his facts.

Some discussion ensued, and the chairman then produced some specimens of Fothergill's process by Mr. Morley.

DR. RILEY then addressed the meeting at considerable length upon the method of saturating the collodion film with albumen. He related the results of many experiments, and stated that albumen, which had hitherto been considered an accelerator, had now, in his hands, become a retarder of the actinic rays. It struck the Doctor that that was because the albumen filled up the pores, so to speak, of the collodion film, thus causing the film to become less "*structural*," and depriving the actinic rays of their former power. The Doctor knew that nitrate of silver had the power of coagulating the albumen; and the thought struck him that, if he was to take the *collodion albumenised* plate, reimmerse it in that bath, and ultimately wash it with distilled water, that he should restore the *structural* condition of the film; he tried the experiment, and the plate (which was before almost inactive in the camera) produced a negative in fifteen seconds by an ordinary quarter-plate lens,—the light being at the time unfavourable, the result was marvellous — the sensitiveness of the plate was perfectly restored. The Doctor then explained his many experiments with iodides. The metallic iodides had the property of coagulating albumen, which the alkaline had not. He then iodised some collodion with iodide of cadmium, and in other respects followed the formula of Mr. Fothergill, and obtained a negative in 10 seconds, with blisters. He then tried 3-4ths iodide of cadmium and 1-4th iodide of potassium, and procured a negative in 6 seconds, with the quarter-plate lens (*without* the second dip), but still having blisters. He then tried whether he could not do without adding any of the iodide of cadmium and without plunging his plate in the nitrate bath to coagulate his albumen, and simply plunged it into boiling water, which at once coagulated the albumen; and he obtained his negative with 6 seconds' exposure, but liable to stains. That, the Doctor thought, proved his theory, that it was due to the altered structure of the film, and not to any chemical action. The Doctor illustrated his statements by negatives.

MR. LEGG then, after some further discussion, produced a contrivance for changing plates in the open air, which was extremely simple, light, and inexpensive.

MR. HISLOP exhibited his new apparatus for taking portraits of children and objects in motion.

MR. BINGHAM then exhibited a plate box, with deep yellow glass ends, for the purpose of exhibiting the contents to Customhouse officers, without exposing the plates to the light.

Miscellaneous.

IMPROVED SELF-SUPPORTING FUNNEL.—There cannot be the slightest doubt but that nearly all photographers have at one time or another felt how cumbrous the present funnel-stand is when placed upon the laboratory table, where every available inch of space is valuable to enable the operator the more readily to have access to the bottles or instruments which may be necessary to the successful carrying out of an experiment or operation. We can easily conceive this to be the case even in a laboratory where there is every accommodation, but how much more is it felt where the laboratory is small and inconvenient, and where every nook and corner is pressed into service. We have recently seen a new style of funnel-stand, which entirely dispenses with the present clumsy machine of wood or iron. It is composed of gutta percha. It is a funnel and foot combined in one, which can be applied with the greatest ease to filter baths into horizontal dishes, without calling into requisition the wooden funnel stand. The taper end of these funnels is suppressed to give greater facility in cleaning it. The principle has been submitted to the approval of the French Photographic Society at Paris, who, as we hear, very highly appreciate its utility. It is gratifying to learn, that in an article, concerning the utility of which there can be no question, the inventor has not reserved to himself any right, but that he has freely and generously placed it at the disposal of the photographic world; therefore any photographer who may desire to avail himself of this useful little article of laboratory furniture, can at once have one made. We cannot do less than thank its contriver Mons. George de Bellio, in the name of the photographic world, for his useful and unique idea.

HERMETICALLY SEALED TUBES FOR COLLODION.—We have had specimens of these tubes forwarded to us, for the particulars of which we refer our readers to our advertising columns. It will be seen at once that this is an important invention for the purpose of enabling us to keep collodion for any length of time, either for exportation or otherwise; and, at the same time, it gives us the advantage of having a quantity always at hand, which retains all the strength of newly-made material. The contrivance is very simple. A glass tube is taken with a capillary orifice; it is then filled with the liquid; after which the orifice is sealed by merely applying it to a gas jet or the flame of a spirit lamp. The advantage of this is, that we can always have a supply of good collodion, which, our photographic readers know, is not the case where corks or stoppers are used.

A RELIC OF THE PRIMEVAL CREATION.—In speaking of a globule of water which has been discovered to be visible in the centre of a natural crystal, an American contemporary remarks: If there is any truth in geology, this water is one of the most ancient drops of water in the universe, much more ancient, in fact, than the water which overwhelmed the earth in the time of Noah. To use the words of Dr. Bouchelle, the owner of the crystal in question, this drop is one of those which were veiled in thick darkness when the earth was without form and void. The crystal belonging to one of the primitive rocks, the water therein contained must be primitive also, and would thus date from the early days of the creation.

Photographic Notes and Queries.

TAKING PHOTOGRAPHS THROUGH YELLOW GLASS.—GRADUATED BACKGROUND.

Sir,—In vol. i. p. 61, of the "News," you mention the fact of the sensitive collodion plate being affected through *four or five thicknesses of yellow glass.* I have been long under the impression that a plate may be sensitised, developed, or even exposed to sunshine through yellow glass, without being in any manner affected. For several years I have prepared plates out of doors, and developed them; the necessary amount of light being admitted to the operating room through a single sheet of yellow glass. If the sun shines strongly through the yellow window, it has had a tendency to create a faint or fogged image; but strongly diffused light has never appeared to me to affect the sensitiveness of the plate. I am now working Fothergill's dry process, with great success; and have a portable changing apparatus, fitted with yellow glass (one thickness), and, hitherto, my plates have been unimpaired by exposure to the yellow light.

Is this idea a fallacy? If so, the sooner I find a remedy, the safer I shall feel in out-door work.

A correspondent in your paper wishes to know how a light graduated background may be managed; let him proceed as follows:—Take a negative, and, from that, print a positive on thin paper; cut the figure out with a pair of scissors; blacken both figure and background in the sun and fix the latter, by gumming the corners, on the face of the negative. Print a positive again, and the background will be white; put the figure cut out of positive No. 1 over the figure in positive No. 2, and put them in the pressure frame; make a kind of ball (in your hand) of your pocket handkerchief; expose the positive to the sun, and keep moving the handkerchief over so much of the centre of the figure as you wish to remain white; the figure can't be affected through the paper which covers it. If care is taken the figure need not be covered, excepting by the handkerchief, which must be kept moving in small circles.

Experience will teach the rest. I learnt this dodge in 1848, in Germany.—I am, truly yours, S. S. B.

P. S.—Another simple way of proceeding is, by having a black piece of velvet, with a hole cut in the centre rather larger than the lens, hung by the two corners to wires, or pieces of wood, fastened to and projecting from the upper corners of the camera, the distance between the lens and the velvet being about 10 inches.

A white rag will, of course, give a *white* halo to the portrait.

The black velvet gives a black halo, and is improved by a *white* background being fixed behind the sitter.

[The yellow glass referred to in the article above mentioned, was not the ordinary glass with which dark rooms are sometimes glazed; for this latter purpose a much darker variety, *dark orange*, is the best. The glass we mentioned as having used was very pale amber coloured; and was worthless for protecting collodion plates, as the experiments there mentioned would show. We are much obliged for the information on the subject of backgrounds.]

BROWNING OF CALOTYPE PAPER.

Dear Sir,—I am an old hand at calotype, and, like all who know that beautiful and simple process, still entertain a strong regard for it, in spite of the numerous dry glass processes. Latterly, however, that is, within the past twelve months, I have met with an annoyance I was never before troubled with,—a tendency to the browning of the paper even on sensitising, and that during the autumn and winter months, and with the most dilute solutions. That this cannot be due to anything in the iodising I feel certain, as it has occurred not only in paper carefully prepared by myself, but also in other samples procured from trustworthy sources. The paper I have always used is Turner's, iodised by the single wash, and sunned. I am inclined to attribute the matter to some new ingredient introduced into the paper in the later makes, perhaps in the sizing, and which has a tendency to decomposition in the presence of the chemicals. If you or any of your correspondents can throw any light on this, to me, puzzling subject, I should be very much obliged.

I have never met with this annoyance in Whatman's paper, which works beautifully sharp and clean to look down upon, but its granular texture is fatal in the printing process. Robert W. Hall.

[This is a subject of great importance to all paper photographers, and we should like to see it well discussed in our columns; we have latterly met with somewhat similar annoyances. It is well known that French paper, although suited to most purposes in photography, will not answer for the calotype or similar processes. It is very possible that English makers, in their desire to make paper which should equal the French make, have introduced some material as a *size*, which produces the above-mentioned deleterious effect.]

MR. Mc CRAW'S PROCESS.

Sir,—The seeing that you are ever ready to assist the unfortunate, and to give advice gratis, induces me to draw your attention to your journal, vol. i. p. 50, where there is an account of a cheaper and more permanent way to prevent the fading of photographs. I at once set to work to prepare some paper, paying strict attention to the rules laid down; consequently a number of yellow sheets were prepared the over-night, and anxious enough was I for the morning light, to test the result. I exposed one sheet under a good negative, and watched the thing with eager eyes, expecting to see the rapid change, which was to be in less time than the nitrate; but, alas, I was doomed to disappointment! After one hour's exposure there was a faint impression; and I accordingly set to work with the various washings, and, at last, brought out a smudgy, inky subject—but what was it?—instead of a positive, a negative. I tried another with like success. I enclose two pieces of paper for your inspection; No. 1 has been exposed to the light two or three hours, the other has not been brought out into the light. Perhaps some of your corespondents would give us their opinion on the subject; or the learned photographer himself, might enlighten us. For my part, at present, I am only too glad to go back to the original course. C. B.

[A few experiments of our own have led to somewhat similar results. We should feel obliged if some more successful experimentalist would favour us with his experience.]

COLLODION WHICH DEVELOPES ITSELF.

A correspondent writes to us and says that he has been making collodion with about 3 or 4 grains of gum benzoin dissolved in each ounce, and he states that if the plate is left untouched in a dark room for about an hour after exposure in the camera, the picture not only becomes visible, but gradually developes itself to a very considerable extent, and that by thus pouring over it the usual pyrogallic solution an intense and fully developed negative is instantly obtained. It is to be regretted, however, says our correspondent, that the plate will only remain *tolerably* sensitive for about ½ or ¾ of an hour after immersion into the nitrate bath, and that therefore, as a dry process, there appears to be little advantage in it. He also states, that immediately after exposure in the camera, the plates will only bear the action of a very weak developer, and that he has found that he could not bring a picture out unless he gave it ¾ of an hour to develop itself, but that *then* the pyrogallic solution (1½ gr. to the oz.) immediately produced a dense and fully developed negative.

NEGATIVES AND POSITIVES WITH THE SAME BATH AND COLLODION.

Sir,—Having taken, and carefully read, your very useful paper, the "Photographic News," I do not find that any of your correspondents know of a way to take both negatives and positives with the same bath and collodion; and if this be the case, I fancy the information would be of great use to the photographic world, and would be acceptable to your publication. Having this idea, I enclose you the list of chemicals I use in order to obtain this advantage. And hoping you will find this of use, I am, sir, your obedient servant,

An F.C.S.

BATH.

Distilled water	1 ounce.
Nitrate of silver	30 grains.

POSITIVE DEVELOPING SOLUTION.

Clean water	1 ounce.
Proto-sulphate of iron	15 grains.
Nitric acid	2 drops.
Acetic acid	4 "
Alcohol (more if the plate is greasy) ..	1½ drachms.

NEGATIVE DEVELOPING SOLUTION.

Distilled water	1 ounce.
Pyrogallic acid	8 grains.
Citric acid	8 "

(When used add ½ of the bath to the above solution.)

FIXING SOLUTION.

A mixture of cyanide and water; more water to be applied if the plate is greasy.

The negative solution is to be used before the cyanide, if you want a negative.

CORRECTING A FOGGING BATH.

Sir,—I have gained much useful information by reading your "Photographic News," both from your own remarks and those of your many correspondents, and therefore hasten to send the following means of correcting a negative bath from fogging, supposing from the letter of *C. P. S.* that it is not generally known.

Put into the bath a few grains of carbonate of soda, shake it well up, filter it, and then add a few drops of glacial acetic acid sufficient to tinge the litmus paper a light pink. I am working a negative bath corrected six months back in that way, and have never had a foggy picture since. S. M.

Stratford.

[This plan is sometimes very successful, but we have at other times found it fail. Sunning the bath has then proved of more use.]

VARNISH FOR PAPER STEREOGRAMS.

Sir,—Dissolve gelatine in cold water, apply a little heat after soaking an hour or two, to form a size. Brush this evenly over the picture, after mounting, and dry for 12 hours; when quite dry, have ready a solution of gum damma, made by dissolving 1 ounce gum damma in 3 ounces coal naphtha, which must be allowed to stand, and the clear portion then poured into a perfectly dry bottle; with this varnish again coat the picture, and a clear bright coating will remain on the print in a few minutes. This varnish answers equally well for glass negatives.

John Heywood.

SPOTS ON COLLODION PICTURES.

Sir,—I have been considerably annoyed with spots, and have tried new baths, &c., but all to no avail; when I thought I would try rain water to wash the pictures. They are now quite free from those troublesome spots. I am no chemist, but my opinion is, that the spots are caused by the action of carbonate of lime, which is in most waters. By washing one picture with soft water, and another with hard, you will find the former quite free from spots, and the other spotted, according to the quantity of lime present in the water. Thomas Reid.

Dunfermline.

REMEDY FOR THE FILM WASHING OFF.

Sir,—In your last number you wished some correspondent to suggest a remedy for the annoyance of the film losing its adhesion to the glass. When I find, on developing, the film has a tendency to become loose, I put gum round the edges of the glass, and do not intensify the picture until it is nearly dry; the gum prevents any further loosening, and is not liable to any objection. W. D.

DARK MARKS LIKE STREAKS OF MUDDY WATER ON THE NEGATIVE.

Have any of our correspondents met with the above fault? and if so, can they oblige us by suggesting a remedy?

ANSWERS TO MINOR QUERIES.

How to Commence Photography.—We insert the following letter, as many of our correspondents are in a similar difficulty, and perhaps a full answer to one, will be useful to all:—Dear Sir,—I commenced the practice of photography a little while ago, without any more knowledge of it than I obtained from Hunt's "Manual," a couple of manipulation books, and three or four chemical works. I commenced with portraiture by the positive collodion process; about three-fourths of the photographs I have taken have been complete failures from one cause or another; and those which were not downright mulls, were, excepting two or three, minus the eyes, and the eyes won't come, and I can't make them; they are sharp and clear enough on the ground glass, but they are not at all on the glass plate. Now Mr. Editor, will you be kind enough to advise me as to whether I had better follow the advice you gave to E. B. G. in No. 2 of your valuable journal, and try the talbotype process, or continue the collodion, or tell what I had better do. It is my ambition to become a first-rate photographer; although I only practise it for amusement my heart is in the science, and I hope, if you will now and then favour me with your advice, to produce as beautiful photographs as the most experienced artists. I have a ¼ size double combination patent lens which I purchased; the rest of my apparatus is home made. If you think I had better practise the talbotype, will you please to inform me what I had better practise until that process appears in your "Catechism of Photography." Trusting you will think this worthy of an answer, I remain, yours obediently, *Earnest*.—[Photography must be learned in the same way as any other art or science. A firm foundation must be first laid in the general principles upon which the science is based; and when these are well mastered, the pupil should commence with the easiest and simplest experiment, in order to assist the hand, eye, and judgment, in the proper understanding of the complex phenomena which will constantly be brought under the notice of the earnest scientific photographer. If Earnest had been desirous of becoming a first-rate painter, he would have smiled at the idea of commencing to paint portraits, or academic pictures, before he barely knew one colour from another, and could not even draw correctly; but that is just what he has been attempting in photography. Portraiture and landscape photography are near the top of the ladder, and to reach them you must mount up from the bottom. We are giving the "Catechism" and "Chemistry" for the express purpose of assisting such as Earnest; these two departments of the "News" must be thoroughly well mastered, step by step. We do not wish, of course, to limit the pupil's experimental energies to those two branches; indeed, we think that very much good may accrue from a simultaneous dabbling being carried on in almost all of the tempting processes which from time to time appear in our pages; but it must always be remembered that these are written for advanced photographers, and beginners attempting them will certainly meet with failures and disappointments. It is these very failures that we wish them to have; for, in the commencement of an experimental science, failures teach far more than success,—the latter, when accomplished, being simply *success*, but the former, when overcome, is *experience*.]

To Convert Alloyed Silver into pure Nitrate of Silver.—*S. M.* Alloyed silver consists of silver and copper; to convert it into pure nitrate of silver proceed as follows:—(1.) Dissolve the alloy in nitric acid, evaporate to dryness, and heat the residue carefully and uniformly in a glass, porcelain,

silver, or platinum dish, till it fuses, and the nitrate of copper is decomposed with intumescence; then keep the mass at the same temperature till it fuses tranquilly, no longer exhibiting a greenish cast, and a sample of it dissolved in water, filtered, and mixed with ammonia, no longer forms a blue solution. If the heat be too low or unequal, a portion of the nitrate of copper remains undissolved: at too high a temperature, the nitrate is also decomposed, and silver separated, which may be recognised by remaining behind when the oxide of copper is dissolved in sulphuric or hydrochloric acid. The mass, when cold, is dissolved in water, the solution filtered from the oxide of copper, gently evaporated, and left to crystallise. Or (2) dissolve the silver in nitric acid, add common salt to throw it down as chloride, and then well wash it as follows:—Pour water on it, and stir well; allow it to subside; carefully pour off the clear liquid, and then repeat the washing until the water has no longer an acid reaction. This chloride of silver may be decomposed in several ways.—*a*. A crucible is nearly filled with an intimate mixture of 3 parts of perfectly dry chloride of silver, and 1 part common resin; a gentle heat is applied at first, whereupon the resin burns with a flame coloured green by the hydrochloric acid, formed from the chlorine of the chloride of silver, and the hydrogen of the resin; the heat is then raised to the melting point of the silver, 1 part of borax being added, and a few slight blows given to the crucible to accelerate the melting together of the silver.—*b*. The moist chloride of silver is placed in contact with iron or zinc and water, to which, in order to accelerate the action, a small quantity of hydrochloric or sulphuric acid may be added; and the reduced silver is quickly washed, first with acidulated, and afterwards with hot pure water. This plan is easier than the plan (*a*) with resin, but is not so certain to yield pure silver, as a small quantity of the zinc unites with the silver, and cannot be removed by the acidulated water; so likewise do some of the impurities of the zinc or iron. In whichever way the chloride of silver be decomposed, the silver is to be dissolved in pure nitric acid, the solution evaporated carefully to dryness, and heated to near the fusing point for about half-an-hour; then redissolved in water, filtered, if necessary, evaporated slowly, and crystallised. Another plan is (3) to dissolve the impure silver in nitric acid, and to the dilute solution add strips of copper, and set aside in a warm place for 24 hours. All the silver will be precipitated in the form of a gray powder; wash this thoroughly, and then digest it with fresh quantities of ammonia as long as that liquid acquires a blue colour; the silver is then to be converted into nitrate of silver as above.

To Extract the Silver from Old Filters, Unused Positive Paper, &c.—*T. Clark* has several pounds of little pieces of filtering paper saturated with nitrate of silver. How can the silver be recovered from them? Place a crucible on the fire, and when red-hot introduce the pieces of paper a few at a time; they will burn easily with slight scintillation, and leave an ash, which must be carefully preserved and mixed with about one part of borax and a little nitre (these quantities, however, are unimportant), and exposed in the crucible to a bright yellow heat for half an hour, at the end of which time give it a few knocks to facilitate the settling of the silver, and allow it to cool, and the silver will be found in a button at the bottom of the crucible. For directions for its further treatment see answer to S. M.

Albumenised Paper Spoilt in the Exciting Bath.—*Sol* has a bath for exciting albumenised paper, which after long use becoming discoloured was filtered through chalk; it came through quite clear, and a few days afterwards, was used to excite some paper; the first few sheets turned out very well, but afterwards the albumen came off the paper, and formed a white precipitate at the bottom of the dish. The reason for this is obvious. Filtering through chalk removed the greater part of the silver from the solution, which remained behind as carbonate of silver; the bath was then too weak to coagulate the albumen which, therefore, dissolved out together with the chloride of sodium or ammonium, and precipitated the silver in the bath. Kaolin should be used to decolorise the darkened silver bath, not chalk.

Raised Portraits.—*A Macclesfield Photo.* A very good plan for producing the effect of the portrait in a glass positive standing out from the background is, to place a black background behind the sitter, and, after the picture is finished, to paint (on the plain side of the glass) behind the figure only with some black vehicle, leaving the background clear; when dry, back up with white or light-coloured paper.

Query on Colouring Glass Positives.—A correspondent asks "how to render a collodion positive plate transparent so as to colour it on the collodion side and allow the colour to show through?" We have seen specimens in which the above desideratum was accomplished, but are unable to learn how it was done. Can any of our readers kindly inform us?

TO CORRESPONDENTS.

**** We are now enabled to promise our readers an impression from a plate by Mr. Talbot's process, with No. 10 of the* "Photographic News." *As the issue of this will doubtless involve a large additional demand, which it may be somewhat difficult to provide for, we shall be glad if all our subscribers who wish for extra copies will intimate the same one week in advance.*

Struggling in the Dark.—We are much obliged for the suggestion. It is being already carried out in the "Dictionary."

T. G. D.—You will not be able to obtain more satisfactory results than those you describe, unless you purchase an achromatic lens. It will be impossible for you to make one.

Enquirer and H. D.—Articles on the subject will shortly appear.

C. A. B.—The plate must be warmed before pouring on the varnish, and also kept warm before a fire whilst drying.

T. E. N.—The Talbotype and Calotype process are the same. See a previous number.

R. V. Stuart.—Your nitrate bath is very much out of order. Try if any of the plans previously recommended will cure it. (Try *sunning* it first.) If not, you must make a new bath.

Actinism.—See answer to B.R.M., vol. i. p. 84.

R. J. S.—Most accelerating agents will injure the bath. Glycyrrhizine in the bath is the best and most harmless. About one inch in thickness of a solution of sulphate of quinine in dilute sulphuric acid, 100 grains to the ounce. Ordinary patent plate will do. The dimensions, &c., of the cell must depend on the size you want it.

G. C.—We do not know how linen or calico can be rendered sufficiently transparent and waterproof to form a roof under which portraits might be taken. We should think that too much light would be obstructed in any case.

R. W. F.—Not injurious. See article in the present number.

R. P.—The quality of pale yellow glass varies very much.

A. Z.—Try the plan of redeveloping, given in a former number.

J. D.—C. O. E.—The stop has been placed in such a position that the field was reduced until it will not cover your glass.—Negative process.

R. D.—See C.P.S.'s letters in a former number. No such bath is known.

A Subscriber.—We are expecting further information on the subject. Meanwhile try iodide of potassium. We have not yet experimented on the subject.

G. S.—We do not know of a way of testing whether the chemicals are in working order by means of a piece of copper.

W. S.—Use hypo., and fix till all the yellow iodide of silver has disappeared.

L. L. B. Cantab.—It will be better to precipitate the silver from the old bath, and make a fresh one. Answer to the other query next week.

Cupidus Scientiæ.—Your idea is totally incorrect in theory. For the note on wood engraving we are much obliged.

Hopeful.—Paper of some dark colour: either glazed or not, to suit your taste.

Excelsior.—Add 1 grain of bromide of calcium to an ounce of your iodised collodion, and 1 drop of nitric acid to your bath. Sulphuric acid is not good in the developing solution, in our opinion; some operators use it, however. What black varnish was used on the picture sent? it seems very good.

Subscriber.—The time of exposure can only be found out by experience. Not much longer than for a positive.

Scotia.—No method is known by which portraits may be taken on paper without printing from negatives. All the necessary details are given; common sense will supply the rest.

R. G.—The print is pretty good. (Why do our correspondents only send *spoilt* prints? Is not the information they ask for worth a good copy?) We do not think *your alteration an improvement*. Advertise.

Bendigo.—The calotype process, like all others, requires practice and experience before good results can be obtained. *Bendigo* should be the last person to be daunted by a little difficulty. Fight against it manfully, and you will conquer.

J. F. M.—We hardly know where you can get all the materials you want at the price named. Thanks for the letter.

X. Y. Z.—Old Hypo.—A. Q. X.—One.—Ignarus.—A Subscriber.—Humbugged.—A Young Beginner.—H. G. T. Our correspondents will see that it is out of our power to save them the trouble which is indispensable in mastering the principles of any science.

Communications declined with thanks:—T. S.—Amateur, Hive Cottage.—W. D.—C. C.—A. B.—G. L. P.—Dr. Syntax.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—H. B. P. Z.—Poor Novice.—J. L.—Half-green.—R. T.—D. W. H.—A. M. P.—A Novice.—Frances.—E. T.—Sphynx.

In Type.—A. N.—C. N. P.—J. L. S.—F. W. B.—A. Molson.—W. L.—C. B.—L. L. B. Cantab.—J. F. M.—Ajax.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

Vol. I., No. 9.—*November* 5, 1858.

TO OUR READERS.

The Photoglyph which we propose to give with our next number will be followed, at a short interval, by another larger specimen of this new art, the particulars of which will be duly announced. The delay which has occurred in presenting the first one to our readers arose chiefly from the inventor having wished the steel plate to be highly polished in a particular manner. It being now ascertained that this would cause a further delay, which was deemed unadvisable, a small etching has been selected for publication in our next number, which, though made as long ago as the beginning of August, does not differ in principle from those which are now made by the method fully detailed in our No. 7.

THE PROSPECTIVE ADVANTAGES OF THE NEW ART—PHOTOGLYPHY.

The public generally is so little likely to appreciate the full importance of the invention of Mr. Fox Talbot, on first reading the details of his invention published in the "Photographic News" of the 22nd ult., that we think it will not be superfluous in us to point out one or two of the more important probable consequences that may result from it. All who have seen paintings of scenes with which they are familiar, will remember the difficulty they experienced in recognising, at the first glance, the places represented. It required an effort of the memory to recall the resemblance, notwithstanding the existence of some conspicuous object which there could be little difficulty in identifying. The reason of this is, that the painting is not and cannot be an exact representation; it approximates to that, more or less closely, and that is all. Moreover, the painter idealises the subject, and exhibits it under the most favourable appearance which colour is capable of giving, and this is an additional obstacle to its ready identification. In the case of the photograph this difficulty does not exist. It is true that the beauty derived from a harmonious blending of colours is wanting, but then there is absolute fidelity of representation. The same agent which reproduces the elm beside the village church, will reproduce the rook perched in apparently philosophical contemplation upon it, and the church itself will not be represented without its noisy congregation of jackdaws. Even where the scale of the photograph is so much reduced that these minor objects are rendered almost invisible to the naked eye, the application of a magnifying glass will show that they are represented as faithfully as the larger objects. It is this extraordinary power of reproducing fac-similes that gives to photography its principal value; which value, however, is much lessened by the fact, that these copies cannot last. It may surprise those who have so earnestly advocated the reproduction by this means of fac-similes of rare books and engravings, as well as of the title-pages of such books for the Museum Index, to learn that, if their ideas were carried out, in all probability not one of these fac-similes would remain in existence twenty years hence, and that the index would have to be commenced *de novo*. Hitherto no method of printing photographs on paper has been found capable of resisting the effects of time, and those who have formed collections of these pictures have the mortification of seeing them fade away, and ultimately vanish completely; a matter of comparatively small importance, perhaps, as regards pictures, but a very serious matter as respects photographic portraits on paper. At the time when death or other causes may render these portraits of inestimable value, they will gradually fade, and most likely leave only a faint stain upon the surface of the paper. It may, to a certain extent, console those who possess such portraits to be told that, if they do not suffer them to fade too far before taking them to a photographer, they may have them reproduced with much of their former vigour. To discover some method of overcoming this want of stability, and to make a photograph as everlasting as an engraving, have occupied some of the most able photographers, both in England and on the continent, for years past; and at the present moment there is a prize of 8000 francs, deposited by the Duke de Luynes in the hands of the French Photographic Society, to be given to the man who shall discover a method of printing photographs in carbon; that substance being unassailable by any known chemical agent whatever, and equally insensible to the effects of light. There are several competitors already in the field, and an Englishman, Mr. Pouncy, has produced photographs by a carbon process, as he asserts—for he keeps his method of operating a secret—upon which we have already pronounced favourably. The new process of Mr. Fox Talbot scarcely lessens the desirability of discovering a method of printing photographs in carbon, inasmuch as the labour of engraving a plate greatly exceeds that of printing a small number of photographs. It appears to us that the importance of Mr. Talbot's invention—which it is impossible to over-estimate—chiefly consists in its applicability to the engraving of plates for the illustrations of books, at such a low rate, that even the cheap publications which, with one or two exceptions, are now obliged to content themselves with engraved wood blocks, may, instead of these, give an engraving which will be mathematically correct as regards perspective and the scale of the objects represented. For the illustration of books of natural history of animals, as well as of flowers and plants, this invention is invaluable; and even the most minute microscopical animalculæ (such as the parasite of the parasite of the bee described in a recent number) can be reproduced by photography in the camera, and then transferred to a plate by this process, with the correctness no human hand could give. The paintings which form the pride of our National Gallery, the existence of which is unknown to the mass even of those who reside in this city, may be made familiar to the most remote peasant, by means of photographs engraved by this process. The rising painter, whose work is admitted for the first time to a modest place on the walls of the Royal Academy, may by this invention be made known to thousands who would otherwise not have heard his name till ten or twelve years later. When we consider the immense number of landscape and *genre* paintings, the contemplation of which has given hours of pleasure to a limited number of individuals, we cannot but wish that a similar pleasure should be within the reach of our poorer brethren who lack our advantages. Surely, if the taste of the masses is to be raised by a contemplation of the beautiful, this invention offers the most ample means for accomplishing that object.

Up to the present time the number of paintings which have been engraved has been very limited; this has arisen, partly from the great expense of employing a good engraver, and partly from the limited sale of engravings, prin-

cipally, we think, owing to the high prices it is customary to charge for them. In future, if Mr. Talbot's invention succeeds as well as we believe it will, there is no reason why every painting exhibited should not be engraved, and copies of it sold at such a price that the walls of the poorest cottage may be adorned with real works of art, in lieu of the prodigal son in bright blue, leaning on the bosom of a father in bright red; or, instead of Balaam in a yellow wrapper, with a savage face, and butcherly intentions towards a meek-looking jackass, who appears more like a patch of sticking-plaister than anything else; or, the more esoteric representation of a nude little Cupid, with a lady of striking appearance in respect to colour, sailing down a placid river in a washing-tub.

THE STEREOSCOPIC ANGLE.

Sir,—Absence from London, and much occupation, has prevented my answering, till now, a portion of an article on my work on Photography, which you reprinted from the *Literary Gazette*.

I consider that any discussion upon a subject so technical as the stereoscopic angle, will be more suited to the pages of the journal specially devoted to photography, and therefore, with thanks to the writer in the *Gazette* for the favourable opinion he expressed on my book in the rest of his article, I pass to my argument.

I am quite prepared to maintain the statement I make in my work, namely, that the angle must be varied from the distance apart of the human eyes, for objects at some ten feet from the camera, to "fifty feet for mountains at ten miles, provided always that the *foreground objects* are not *near* the lens."

In writing the foregoing, I admit that the appearances which we see in the "mountains" (?) of Westmoreland and Cumberland were not, at the moment, in my thoughts; they are to the spectator *flat*, in tones of gray, consequent upon their small scale and our hazy atmosphere, when seen at a distance of "ten miles," and have been so represented in art; and were the stereoscopist to endeavour to form a relief in the representation of them which is not apparent in nature, he would be amenable to criticism. But the case is widely different when we treat the Titanic masses of the Alps or Pyrenees, where the purity of the atmosphere, and the colossal scale of the subject, enable us to discern perfectly, at twenty miles, the bare granite peaks standing in distinct relief, their every form made out, their shadows cutting firmly on the pure snow—appearing so perfectly modelled, that the traveller is incredulous when told that a day's journey intervenes between them and him. These are "mountains;" and when I wrote I was thinking of the appearances of the Jungfrau, the Oerteler Spitze, the Maladetta, &c., not of the "green sward" of the Westmoreland hills, and their atmospheric effects.

I maintain that if the cameras for such subjects were to be placed "at the distance apart of the human eyes," the operator had better entirely spare himself the trouble of taking two pictures at all, for the mere *spot* which the point of view would be, in such case, *relatively to the distance from the objects depicted*, might be equally as well represented by duplicates from the same negative. Nay more, to carry the illustration of the principle to a farther extreme, may I ask —if a stereoscopic representation of the sun were desired, which we equally see with the human eyes, distance 2½ inches, or of our satellite—would it be feasible that it should be made at that angle?—and *what stereoscopic effect* would the 2½ inches produce on the 95,173,000 miles, the distance of the former luminary from us? In such a case I should carry out the *same principle* I have advocated; but I fear my "sliding scale" would be far from palatable to those who could not digest my former *moderate* angle. I maintain that, if you attempt to give any stereoscopic representation of the sun, THREE THOUSAND MILES, or more, between the cameras would not be too much for a distance of 95,173,000 miles; and say that one operator was at Paris, the other at Constantinople, with twin instruments, and accurately adjusted chronometers, and that, by these means, pictures were taken at the same instant, we might hope to secure really stereoscopic representations, which would, probably, solve questions of the highest scientific import; amongst others, the nature of the solar spots would be likely to be determined.

It is true that an image of the entire orb of the sun with stereoscopic effect will, probably, never be obtained under any conditions, since the very nature of *self-illumined rotund* bodies in an intense state of incandescence is to appear, to our organs, flat. Take a round bar of iron, heated to a white heat, into a dark apartment; the effect it will produce on a spectator is, of a flat surface, a quality which will therefore apply, in a multiplied ratio, to the intense solar light, against which even the oxyhydrogen lime light appears black. This is not the case with the moon; illumined as she is by the light of the sun, with shadows projected from the inequalities of her surface, we may fairly hope that, *sufficient angle being given*, we may obtain a rotund effect, which will delineate, in a remarkable manner, her structure.

In my opinion the "model-like effect" complained of in many stereographs is due to the crudity of the negatives, and consequent want of atmosphere, scale, and distance, and, in architectural subjects, to the *total absence of figures*: to cite examples—the bridge of Prague is one of the most picturesque subjects in Europe; in the stereoscope it certainly has a Dutch toy-like effect; the buildings rise square, harsh, and abruptly from the ground, without groups of figures and vehicles to serve as a base, and *mark their scale*. And, as atmosphere, let any one compare Heidelberg and the valley of the Neckar, by Ferrier, with his last improvements, its atmospheric distances, the shadowed sides of the buildings reflected into and delicately drawn, with Zion in the Valais, an earlier work by the same hand, in which the "model-like effect" is entirely caused by the heavy black shadows, and *want of atmosphere*. This comparison will at once show how important are the results of *sufficient exposure* and well covered plates, particularly on glass pictures; and that it is erroneous to attribute always to defective angle what may very probably belong to the imperfect rendering of atmospheric perspective. Apologising for occupying so much of your space, I am, sir, your obedient servant,

London, October 28th, 1858. LAKE PRICE.

PHOTOGRAPHY IN ALGERIA.

NO. III.

My Dear Sir,—I have at last received the first number of the "Photographic News," and am not a little rejoiced to find that it contains the first letter I wrote to you; and I look forward with some little eagerness for the number which may contain my second letter—I presume about No. 3 or 4. As a photographer I am, for several reasons, extremely glad to see a weekly paper devoted to photography. In the first place, by giving one an opportunity of becoming acquainted with all discoveries of any importance made on the continent as well as at home, it will save one the possible annoyance of spending hours, or even days, in making experiments which had been previously made: it will induce some thousands (it is to be hoped) of photographers to study the chemistry of the art, and thus greatly increase the possibility of new discoveries being made in it. The answers to correspondents will remove stumbling-blocks from their paths; and, what is to me personally—and doubtless to all other old photographers—a matter of no small importance, is the reflection that I need not in future compel myself to read foreign photographic publications, seeing that the "News" will keep me *au courant* as to what is stirring on the continent. . . . .

I have not yet been up to the tents, as I informed you was my intention in my last letter, for a reason I am

about to explain. Shortly after I had returned from the Post-office I received a visit from Sheikh Hamed, who proposed that, instead of going at once to his douar, I should accompany himself and brother in an expedition against a mountain tribe that had recently made several attacks on the Arabs living under French protection. His brother was an officer of the *Spahis Indigenes*, who were selected to form part of the expedition, and had directed him to say that there would be no difficulty in finding means of conveying whatever instruments I might require for photographic purposes. The proposition was, as the sheikh said, *séduisante*. It would, possibly, give me an opportunity of getting some interesting pictures, and was certain to enable me to get some information which would be interesting to your readers generally, and especially to those among them who may happen to come out here; consequently I accepted his invitation. The next thing to be considered was, how I could best succeed in obtaining some good pictures. The most convenient would have been the dry collodion process; but as this had failed me on more than one important occasion, I was reluctant to employ it where a failure could not be remedied. Considering the interest felt on the subject of dry collodion, both in France and England, when I left home, I may be excused if I offer a few remarks relative to my own experience with this process since I have been here. The collodion I have been using was purchased in London, half a dozen bottles of which I brought with me from England. Living in a city I have not found it necessary to test the length of time during which this collodion would preserve its sensibility, my usual practice being to prepare the plate or paper overnight, which I do in the following manner as regards the paper:—I lay the sheet of paper on a table and rub it rapidly, though lightly, with a piece of india rubber until the paper is quite warm—in fact, is highly charged with electricity; I then support it on a piece of glass, pour on the collodion, and allow it to spread itself smoothly over the surface; then sensitise and wash it well in several waters, and when dry, cover it with a weak solution of gelatine. In this way I have prepared papers 14 × 12, upon which I have generally obtained good pictures. There are two lying on my table at this moment—one a view of the port of Algiers, and the other a view of the suburbs of the city—which could not, in my opinion, be excelled. I had my tent with me when I took the latter, and before exposing the paper I wetted its surface with a little water, and while still moist I placed it in the camera; the result was, as I anticipated, the rapidity of the action was much increased, and the picture, when developed, appeared more dense. The conclusions I drew from this experiment were, that it was advisable to use the collodionised paper as soon as possible after preparation, though not absolutely essential; or, in the event of keeping it for any time, some method of softening the sensitive surface previous to exposure would render the result more favourable. To test this I adopted the following plan:—I prepared some sheets of paper and put them aside for about three weeks, at the end of which time I brought them out and laid a very thin sheet of damp blotting paper on the sensitive surface of each, and then packed them in my portfolio in such a way that the blotting paper was in contact with blotting paper, and in no case with the back of the prepared paper. I found this method greatly increased the rapidity of the action of the light upon the sensitised surface, and I generally succeeded in getting good pictures by this process, which I do not doubt could be improved; indeed I propose, if opportunity serves, to moisten the blotting paper with a weak solution of some substance which I hope will act as a stimulant to the dry collodion, and thus render its effects more certain. Especial care must be taken that the blotting paper does not contain too much moisture, or it will have the effect of dissolving the gelatine and rendering the surface of the collodion rough and uneven, if it does not damage it still more.

To return to my journey. I was determined to take with me the means of obtaining pictures; and though the dry collodion offered great facilities, I eventually decided on sticking to the wet collodion, though it involved the possibility of not getting any pictures at all: for rapidity of movement being the great thing in these expeditions, it was to be feared that, owing to the limited number of baggage animals taken, my camera might be in one place, and my tent where it could not be found. It was necessary, however, to risk this, so I packed up my apparatus and sent it to the sheikh, taking care to follow it myself and see it packed, for to have done otherwise would have been to have acted with as little consideration as a negro here, of whom it is said that, being told to saw off a bough of a tree, he sat himself on the branch and sawed away at it, between himself and the tree, until he and it came to the ground together; upon which he uttered an exclamation in a tone of the deepest surprise, which being interpreted (very freely) signifies, "By golly, massa, who'd tought him come off boff ends at once?"

. . . . . . There was a faint glimpse of dawn when the soldiers began to assemble, yet, so complete were the preparations, that the sun had risen but a very little way when they commenced their march. It felt quite cool and pleasant in the early morning, and so pure was the atmosphere that we could see an immense distance across the desert. The mere motion in it excited a feeling of exhilaration to which I had long been a stranger. After marching about five hours we halted beside a well, around which a great many Arabs resided, of whom we got milk and a kind of cake very much resembling what in the "far west" is termed damper. A very few years ago these Arabs were bitter enemies of the French, whereas now they appeared to be without the smallest animosity against them; and certainly if the French have made themselves their masters, they have done more for them than they, the Arabs, could possibly have done for themselves. The artesian well, around which we halted, was the work of French engineers, and to the water from this well was entirely owing the fertility which the desert around it exhibited, and the dwellings that were so thickly scattered about, where a few months before there had stood perhaps not more than one or two tents. None but those who have spent days in the desert traversing hot sands which scorch even the bare thick-soled feet of the Arab, who can journey along the roughest mountain road without danger of cutting them, can fully appreciate the blessing of an abundance of water; therefore the Arabs, who are not utterly ungrateful for good done them, are becoming more and more reconciled to the rule of their conquerors. The opportunity of getting one or two photographs of the halt was not to be neglected now that there was an abundant supply of water, so, with the assistance of my friend, the sheikh, I pitched my tent and took a couple of views, one of the troops, and another of the village. An amusing circumstance occurred here illustrative of the coolness of Arab thieves. A Zouave had taken off his baggy trousers to make some necessary reparation, and while in the act of plying his needle he was called by one of his comrades to come and take his coffee. The trousers were thrown aside for the moment, and the Zouave employed himself actively in discussing his breakfast, which occupation so entirely absorbed his attention that he was unaware of the proceedings of a native, who had quietly crept to the trousers and was making off with them, when a shout was raised by a Zouave who had observed his motions. Of course he was immediately seized and taken, with the stolen goods in his possession, before the provost, who at once ordered him a flogging; the sentence was no sooner interpreted to him than the fellow, to the great amusement of all present, coolly said, "I suppose, Mr. Judge, I may keep the trousers." By the time this little affair had been settled the troops were again under march, and did not halt for three hours, and then only for about an hour, when they resumed their march for three hours more. In the desert it is the practice, as far as possible, to regulate the marches so that the halt for the night may be near a well; but this is only when

there is no especial hurry for a day or two, which was the case with us, inasmuch as we were marching against a tribe in the mountains whom we were certain to find there when we arrived. Had we been directed against a tribe encamped in the plain, we should have pushed on at a much greater rate, because if we had not "dropped on them," as M. —— expresses it, like a thunderbolt, they would have sent away their flocks and cattle, even if they had stayed themselves for a fight; and, under these circumstances, the number of hours which the troops march is surprising. A Zouave told me that he had formed one of an expedition which marched forty hours out of the forty-eight, and at the end of that time attacked the tribe of which they were in search, and captured every animal they possessed, and utterly routed them. It is a pretty sight to see the groups of soldiers scattered about at the bivouac, and the contrasts of colour in the red, baggy inexpressibles of the Zouaves, and the white burnouses of the Spahis, was as pleasing to the eye as anything I ever saw; and it was with no little regret that I was obliged to content myself with reproducing the *form only* for my friends in England, without being able to communicate to them a part of the pleasure I myself derived from *colour*. As it grew dusk fires made themselves gradually visible, and by their flickering light one could see here and there a man sewing up a hole in his clothes, or repairing his shoes; but the greater portion of them were lying down smoking, chatting, and making a tremendous hubbub. The contrast between the Spahis and the Zouaves was striking. The Arabs were sitting about in groups, grave, and for the most part, silent. All of them were smoking, and here and there one of them was holding forth respecting the chances of plunder which the expedition offered—a matter in which they feel a far keener interest, I believe, than in the credit of the government they are hired to defend. I don't mean to imply that they are indifferent to the pleasure of cutting a fellow-countryman's throat, for I certainly think they do that with as much gusto as any Zouave who has seen his comrade shot down beside him, but they have an ever-craving appetite for plunder which can never be appeased; an appetite strengthened by the kind of warfare in which they have been trained. It may perhaps appear to your readers that these Spahis are mere hired bravoes who are enlisted by the French Government to fight against their countrymen, but this is not the case; these Arabs belong to tribes which are principally resident in the neighbourhood of the towns, whereas the tribe against which they are generally led by the French is that of the Kabyles, an independent-spirited, courageous race, who mostly inhabit the mountains, and are a terror to Morocco on the one hand, and a pest to the French rule on the other; but before many years are past France will be able to say, with Sganarelle, "*Il etait autrefois comme ça, mais nous avons changé tout cela.*"

[In consequence of the length to which our correspondent's letter extends, we must defer the publication of the remainder until a succeeding number.—Ed.]

NOTES FOR ALPINE PHOTOGRAPHERS.*

Before going further I must say a few words about our baggage. In addition to our cameras and stands, and prepared plates, we had, of course, our carpet bags. My camera is what is called a tourist's camera, made by a good maker, very handsomely got up, very expensive, and, for its size, very heavy. This latter was not of so much consequence to me on this excursion, as I was not *verdant* enough to carry all my baggage myself; but I confess to feeling sundry qualms of conscience when I saw our "porteurs" sinking continually in the snow while we were crossing the pass of St. Théodule. It is quite necessary, whether the amateur carries his own camera or not, to reduce to the smallest possible weight all the metal and wood-work therein. All the complication of parallel rulers with their screws, can very well be dispensed with. My companion, Major de R——, a distinguished Russian officer, had the happy idea of carrying his small French camera, and all the rest of his baggage, in a light basket in which the peasants in this canton (Vaud) carry almost everything—fruit, vegetables, bread, meat, and even manure. They call this useful contrivance for their back a "hotte," answering to our word "hod." We perceived that after we left this canton, this "hotte" was everywhere an object of curiosity; and on the other side of the Alps, it was looked upon with the greatest astonishment, if not suspicion. At all events it proved a very useful packing case—doing away with the necessity of any other—easily carried on a man's or mule's back, and though containing a lot of bottles, for my friend purposed developing some paper negatives each night (which, by-the-bye, he did not), it did not weigh so much as my baggage.

We had never been at Zermatt; and as every guide book, and almost every traveller, tells you that it is *the thing* in Switzerland, and far superior to Chamouni (though I don't agree with them), we determined to bend our steps that way. Now, "though on pleasure bent, we had a frugal mind;" and we, therefore, resolved to do a considerable portion of the journey on foot, hiring a mule to carry our baggage. Our walking, however, did not commence until we reached the dirty, poverty-stricken little town—if town it can be called—of Viège or Visp, in the Canton du Valais. This same Visp still bears lamentable traces of what it suffered from the earthquake which played such havoc with this part of the Valais in the autumn of 1855.

Our starting place was Lausanne, the town and neighbourhood of which afford great scope for the camera. Indeed, I know but few places so rich in picturesque bits. Major de R——, as well as myself, had been residing here some time, and we had together rambled about in search of the picturesque. Probably a note or two of the things to be taken here may not be amiss. The handsome cathedral of Notre Dame is a very attractive object, as seen from various parts of the town. It was founded about the year 1000. It is finely situated on rising ground in the centre of what is called the "cité," and commands an extensive view over the lake and surrounding country. A remarkably beautiful view of it can be taken from the Berne road, another from the delightful promenade of Monthenon: in the foreground are some of the arches of the "Grand Pont," a handsome modern viaduct connecting two portions of the town. In the extreme distance you have a south-west view of the cathedral, with its handsome towers, and the middle distance is filled up with quaint-looking spires, houses, and public buildings. Like our English cathedrals, that of Lausanne is so hemmed in by buildings that it is difficult to obtain with the camera many of its details. It is, however, just possible to get a view of the South Porch, or "Porch of the Apostles," so called on account of the carved figures therein; and a very charming thing it is. You will see, by the little photograph I inclose, that it is not easy to obtain a correct view of it. You will see, also, that it is well worth taking, even if you are compelled to raise the nose of your camera high enough to throw the lines out of the perpendicular. It should be taken on a sunless day; the buildings near it throw such a shade over a portion of it all the day. There is a fine rose window in the south transept, but too high to be obtained unless it is possible to take it from the top of a house just built, I regret to say, within a few yards of it. The west doorway is very fine—the door itself, abominable.

The château not far from Notre Dame offers one or two good points of view. The "Place de Palud" contains a nice old fountain, well worth taking; also the Hotel de Ville. A fine view of the cathedral from the Place de Riponne, should be taken in the afternoon because of the light.

The church of St. François has two or three good points for a photograph, especially the apse and spire as seen from the promenade near the Hotel "Belle Vue."

* Continued from page 89.

For those persons who are staying at Lausanne a few days, there are plenty of short excursions to be made, by the railway and boat, to places abounding in excellent subjects for their portfolio. Half an hour by boat or rail takes you to Moyes, a little town on the shore of the lake; from thence a pleasant walk of two miles brings you to the noble château of Wuffens, in ancient deeds Wolflens or Wonflenscastrum. Popular tradition asserts that this magnificent castle was built by good Queen Berthe, wife of Rodolph the Second, King of Burgundy, between 921 and 962; and tradition likewise asserts that the bricks, of which this enormous pile is composed, were cemented together with mortar mixed with wine instead of water: however this may be, the mortar is remarkably hard, much harder than the bricks. According to the most probable accounts, the castle dates as far back as the time of the crusades, the twelfth century; and judging from the curious subterranean vaults under the château, it is most likely that the present structure was built on the ruins of one much more ancient. S.

(*To be continued.*)

THE PHOTOGRAPHIC SOCIETY.

On Tuesday evening last the Photographic Society held its first monthly meeting of the season at the Coventry-street Rooms. We were glad to see such a goodly attendance of members; and if we may judge by appearances, we should say that the forthcoming series of meetings may prove very interesting and instructive. Mr. Fox Talbot had sent several specimens of his new photoglyphic engravings, which were examined with great interest by the members present, who commented freely upon the present achievements, and the probable future success of this great discovery. Mr. J. D. Llewelyn had also contributed a complete set of those charming pictures which he has already exhibited. We need only mention this fact to call to the mind of the reader those very beautiful specimens of the oxymel process—a process by which no one but Mr. Llewelyn can produce such results as are here presented. Beautifully and clearly developed as the exhibited specimens were, we are almost inclined to think, that those at the Society's Rooms are still more beautiful. There was also a set of photographs exhibited by Mr. Sturroch, some of which were remarkable for the delicacy with which the detail was rendered; this was especially the case with some fine architectural views which, for beauty and clearness, we have not seen surpassed, while others were but very inferior; indeed, there are among these some that may be denominated the best, while, on the other hand, there are some that may be denominated the worst we have seen. There was also a specimen of, what we have on other occasions designated, "patched" pictures. Considering what has already been done in this department by Mr. Henry P. Robinson and Mr. O. G. Rejlander, we are really astonished at anybody having the temerity to exhibit a picture which has not a single claim to the attention of even the merest tyro in the photographic art. There are no grounds upon which we can recommend it, either artistic or photographic. It is not a picture representing an incident or a sentiment, but simply a family group, certainly not grouped in a manner that reflects much credit on the composer. The novelty which, we presume, the composer thinks he is presenting to the professors and students of the heliographic art is, that the picture is composed of several negatives. But what shall we say of the manner in which the joinings are effected? They certainly are novel. The wonder of such pictures as Mr. Rejlander composes is, that he disposes the light and shade over his compositions so that the spectator is unable to discover the joinings; but, in the instance before us, we have every negative plainly indicated, not only at the places of junction, but also in the colour of the several negatives—one being light whilst another is dark. The first or second joining is just passable; but as we approach the middle, the whole composition is nicely varied by a crooked line of white here and there intervening, sometimes a quarter of an inch wide, while a buffet or footstool is pleasantly situated in the middle of the picture, reminding one forcibly of the geographical description of an island, which is "a piece of land surrounded by water"—while the footstool we allude to is a black mass surrounded by a white fringe. Our object in thus alluding to a worthless picture is, to warn photographers from sending such silly things for inspection at a meeting of the London Photographic Society, where one expects to see, not the simple, first attempts of novices in the art, but the results of processes or some of the multiform adaptations of photography. There were also some specimens of Poitevin's process of photo-lithography exhibited by Mr. Malone, which had been brought for the purpose of comparing them with those of Mr. Fox Talbot. These photo-lithographs were, for the most part, copies of patterns and portions of fine architectural buildings. It could not fail to be seen, even by the most unobservant, that these specimens were indeed beautiful; yet it is unfair to bring them into comparison with the productions of Mr. Talbot, inasmuch as that gentleman's views are almost exclusively landscapes, or views of whole buildings, in which it is much more difficult to attain anything like perfection. While the views by M. Poitevin were selected so as to show to the best effect what that gentleman can do, in the case of Mr. Talbot the reverse seems to be the case. However, the subject will be treated more at length, as a paper—or, at least, a discussion—has been promised on new processes which have been invented to supersede the engraver. Mr. Delamotte exhibited a large view of the Crystal Palace, which was remarkable for its large size, the beauty of its half-tints, and the nicety with which the detail was rendered. When we visited the Crystal Palace recently, we recollect seeing some photographs—or at least what *were* photographs—of the same subject, if we mistake not, by the same gentleman; and, as far as relates to the correctness with which they represented the sentiment which Mr. Robinson has so ably illustrated in another way, we think that they were still more successful, for they bore the most unmistakable and decided evidence that they were "Fading Away," a fate which we hope will not overtake the specimen above alluded to.

Owing to the absence of the Lord Chief Baron, Mr. Roger Fenton occupied the chair. A paper was read by Mr. Reeves Traer, M.R.C.S., on "The Photographic Delineation of Microscopic Objects;" after which there was a discussion, which lasted until ten o'clock. We refer our readers to another column for a full report of the proceedings of the meeting, and the discussion which took place after the reading of the paper was terminated.

Photographic Chemistry.

NATURE OF THE METALS.

(*Continued.*)

Potassium is a metal of a silvery colour when freshly cut, but which speedily becomes tarnished if exposed to the air. It is therefore necessary to preserve it below naphtha if it is desired to keep it free from change. At ordinary temperatures it is so soft that it may be moulded with the fingers; but when cooled to the freezing point, it becomes brittle; it melts at 150°, and is vaporised at a heat a little below redness. Its affinity for oxygen is so great, that a piece of this metal thrown into a basin of cold water decomposes the water with such rapidity, that the liberated hydrogen ignites, burning with a beautiful red and white flame, which continues so long as there is a particle of the metal floating on the surface of the water, which, when the flame is extinguished, will be alkaline. It combines with oxygen, forming protoxide and peroxide. The protoxide, or potassa, is formed when thrown into water; the peroxide, when

the metal is burnt in oxygen: it is also that which remains when nitre has been heated until totally decomposed. If this metal be heated with sulphur or phosphorus, it combines with those substances with brilliant combustion, and forms a sulphuret or phosphuret of potassium. To form the chloride a piece of the metal may be introduced into a jar of chlorine, when it immediately bursts into a brilliant flame. It absorbs cyanogen gas, becomes red hot, and forms cyanide of potassium. Potassa is formed by a combination of one equivalent of this metal and one of oxygen. A small quantity of this substance added to the iodide bath is said to give rapidity to the negative proofs: it is also occasionally employed in varying the tones of positive proofs after they have been submitted to the hyposulphite baths. A solution of common potash is very useful for cleaning glass plates.

Sodium is a metal in many respects like the preceding; it is silvery in appearance, tarnishes in the air, and, to preserve it without change, it should be kept under naphtha, that liquid containing no oxygen. It is rather less violent in its action than potassium when thrown upon water, it does not burst into flame, but effervesces violently, and the water is changed into a solution of soda. It combines with oxygen to form protoxide or *soda* and peroxide. It combines with sulphur and phosphorus under the same circumstances as potassium. If introduced into chlorine it burns, and the resulting substance is chloride of sodium, or common salt; formed of 1 equivalent of chlorine with 1 equivalent of sodium. This is sometimes used in the preparation of positive papers; but, as the salt of commerce, especially if it contains magnesian salts, deliquesces on contact with moist air, it is preferable to use chloride of ammonium: it may also be used as a substitute for bromide of potassium for temporarily fixing negative proofs; also, for precipitating residues containing nitrate of silver, which it accomplishes by transforming the nitrate into an insoluble chloride of silver, from which the silver may subsequently be obtained in a metallic state.

Calcium is a metal contained in lime. It can only be obtained with great difficulty, and it is therefore rarely seen. Lime is an oxide of calcium, and is composed of one equivalent of oxygen to one equivalent of calcium; there is also a peroxide which contains double the amount of oxygen found in the oxide. If this oxide be exposed to the action of chlorine, it is decomposed—the chlorine being absorbed, and a compound formed, which is called chloride of lime. The oxide of calcium or—to use the more familiar term —lime, is best prepared for photographic purposes by intensely heating white marble so as to expel the carbonic acid. A piece of the result held under water as long as it continues to give off bubbles, and then withdrawn and laid on a saucer until it bursts and falls into a fine powder, is, when cold, fit for use, and may be employed in preparing the bromide of lime and other salts. Calcium combines with chlorine, bromine, and iodine, forming well-known salts.

Magnesium is a metal of little utility in itself, and probably few of our readers have seen it in its metallic state, though they have, doubtless, at some period of their lives, been made familiar with it in its combination with oxygen—a form in which it is generally known as magnesia. At one time, the chief source from whence this oxide was derived was from the sea; but it is now obtained in unlimited quantities from magnesian limestone, a mineral composed of carbonic acid, lime, and magnesia, by the action of heat. Under this action it gives out a bright phosphoric light; and a very pretty effect is produced by placing some of the magnesia, thus ignited, in a saucer, and while still warm, pouring round the edges a little strong sulphuric acid, when, if in a dark room, bright flashes of light are emitted from it, accompanied with a hissing noise. The chloride of magnesium is formed by heating a mixture of carbon and magnesia strongly in chlorine, when the latter drives out the oxygen and takes its place. Magnesium may be obtained by passing the vapour of potassium over ignited chloride of magnesium.

(*To be continued.*)

Dictionary of Photography.

Acetate of Silver.—This salt is obtained by mixing together tolerably strong aqueous solutions of nitrate of silver and acetate of potassa or soda. It falls down in the form of white silky crystals, which, to be obtained pure, must be filtered, washed with a little cold distilled water, then redissolved in hot water, filtered, and allowed to crystallise on cooling. The crystals are tolerably soluble in hot water, but require about 100 times their weight of cold water to dissolve them.

The following interesting experiment is recorded by Mr. Hunt, in his researches on light:—"Two phials were filled with a solution of acetate of silver, and carefully corked; one was exposed for an hour to good sunshine, whilst the other was carefully kept in the dark. At the end of this time, a solution of protosulphate of iron having been made in the dark, 10 drops of it were added to each solution of silver. The one which had been exposed gave *immediately* a copious precipitate of silver, whereas the other was only rendered slightly turbid, and was some minutes before it precipitated. After having stood eight or ten minutes, no difference could be detected in the quantity of silver precipitated in either phial. Acetate of mercury was used in the place of the acetate of silver, and the difference between the actinised solution and the other, on the addition of the iron salt, was very striking.

"The two salts, acetates of silver and mercury, were mixed. One portion was exposed in a large test tube carefully corked, and another portion was protected from all light in a bottle. The exposure in this case was from two to three hours, but during that time there was not more than half an hour's good sunshine. By the light of a taper an equal quantity of sulphate of iron was added to each. In about three minutes the solution which had been exposed appeared a little disturbed, small specks were seen to form in various parts of the fluid, and these rapidly increasing in size, and assuming star-like shapes, fell heavily. At the expiration of an hour a dark and bulky precipitation was formed; but in the unexposed solution the precipitate was but in small quantity, and of a light gray colour. In about two or three hours a coating of white metal was formed, in two well-defined stripes, along the tube which had been exposed to solar influence; one on the side directly facing the sun, and the other on the other side of the tube, but along a line upon which I found, by subsequent experiment, the rays were concentrated by the form and refractive power of the media—glass and metallic solution—through which they had to pass. That these lines were due to the action of the solar rays, was proved by placing a piece of blackened paper around a tube during exposure, which effectually prevented the metallic deposit over the space it covered."

Acetic Ether,—is formed by mixing 6 parts of alcohol, 4 of glacial acetic acid, and 1 part of oil of vitriol, and distilling until a little more than half has come over; the distillate is then washed twice with its own bulk of water, and rectified with chloride of calcium. It has an agreeable odour, resembling that

of apples, and is a good solvent for pyroxyline; depositing the latter, however, in an opaque powdery condition, instead of transparent as ordinary ether does.

ACETO-NITRATE OF SILVER is a term used in the talbotype or calotype process, for the mixture of glacial acetic acid and nitrate of silver solution with which the iodised paper is excited. Mr. Talbot's formula (which we do not think has been improved) is a 50 grain solution of nitrate of silver, to which is added one-sixth part of its volume of glacial acetic acid.

(*To be continued.*)

A Catechism of Photography.

VI.—THE OPERATING ROOM.

Q. WHAT sort of room is necessary for the taking of photographic portraits?

A. It is necessary to have a strong light, and it is usual to have the room fitted with a glass roof, one or two of the sides being of glass also.

Q. Is it not possible to have too much light?

A. Certainly it is; for under such circumstances the photographic effect is too rapid, and favourable pictures are seldom procured. The light should be modified by blinds, which are made to draw over the glass roof.

Q. Cannot portraits be taken in the open air?

A. They can; but there are obvious advantages in having a proper operating room.

Q. How are operations to be conducted in the taking of landscapes?

A. These operations are almost invariably conducted in the open air. It is best to be provided with a landscape camera, a proper camera stand, and a convenient box for holding the sensitive plates previously prepared. Apparatus especially adapted for field operations may be procured at any ordinary photographic depôt.

Q. What is chiefly necessary for the operator to remember in taking out-door views?

A. He should spare no pains in selecting, for a desired view, the most favourable hour of the day—such an hour as will give the lights and shadows of his subject in the happiest and most characteristic disposition. The operator has to bear in mind that his picture will be in *light and shadow only*. He should carefully select, and not too hastily, the best point of view.

Q. What is necessary in the arrangement of the camera?

A. It is obvious that the camera should not face the sun; not only because diffused light may thereby enter the lens, to the injury of the sensitive plate, but a little observation will show the disadvantage of having the shaded sides of all objects fronting you in the picture.

Q. What is the next thing to be done after selecting the point of view?

A. Firmly to plant the camera stand; level the plate on which the camera rests; and fasten the camera in the desired position. Select some prominent object in the centre of the field, and in middle distance, and, with the open lens, the diaphragm being removed, adjust the focus upon this object as sharply as possible. Upon replacing the diaphragm, with half-inch aperture, you will find all the other objects in the field are brought into the same focus. Lastly, adjust your view on the screen of the camera by turning it slightly to the right or left, and giving the desired portion of the sky and foreground.

Q. What should be the extent of the aperture of the lens?

A. Different opinions are entertained; but it is generally agreed that a half-inch aperture to the lens is the largest that should be used for a landscape of any depth.

Q. What is the most favourable light for procuring a successful picture?

A. The most favourable light is, unquestionably, that given under passing clouds. By closing the camera when necessary, and reopening it, thus giving a due proportion of sunlight, and the diffused light through the cloud, the happiest results may be attained.

(*To be continued.*)

Correspondence.

FOTHERGILL'S PROCESS.

DEAR SIR,—Your request for information respecting the process of Mr. Fothergill from those who have worked it successfully will, I have no doubt, evoke such an inundation of correspondence, as will render your duty of selection and arrangement somewhat onerous: you can deal, therefore, with the few hints I send for your perusal as you think proper—either working them up, with other materials, for the benefit of your numerous readers, or excluding them for others which may be clearer and more concise.

By the courtesy of Mr. Keene, of Leamington, I was enabled to report upon the success of my own trials of this process at a meeting of the Birmingham Photographic Society, held several days before its discovery was announced in the *Times*. My success has been constant and uniform, and the resulting negatives *fully equal* to any I have obtained, either by the process of Taupenot, or Dr. Hill Norris; and those who are at all acquainted with these processes will perceive, that this is no slight recommendation. It is, in fact, the simplest and most certain of all the dry processes at present known; and, with ordinary negative collodion, and a silver bath of 35 grains to the ounce—either neutral or slightly acid, it matters but little which—the slightest skill and caution in the manipulation must insure a good picture. There is no difference in the results obtained either by a neutral or a slightly acid bath; the only thing affected is, the *sensitiveness* of the plates, and this is not seriously impaired so long as the argentine solution merely shows a *faint* acid reaction upon test paper. A bath, in fact, which will answer for negative portraiture will suffice for this process; and collodion, either *contractile* or *porous*, may be used indifferently, only taking especial care, if the former be employed, to render it adherent to the glass, by making the latter scrupulously clean. My mode of cleansing the plates is this:—I mix one part of nitric acid with two parts of distilled water in a stoppered phial; in another bottle with a wide neck, and a piece of fine muslin tied over it, I have a quantity of finely-powdered tripoli: a small quantity of the latter is sifted on the surface of the glass, to which a few drops of the former are added; the brisk application of a tuft of clean cotton in a couple of minutes or so soon removes all injurious matter; and a thorough rinsing in common water completes the operation. A chemically clean cloth is necessary; (I invariably use an old towel, which has been washed in *hot*, and then rinsed out in *cold*, *rain water*, carefully *eschewing all alkaline* solutions;) and, for want of care in this stage of the collodion process, many a clean plate is defiled, and much annoyance created. When the plate is wiped dry, I hold it before the fire for a couple of minutes to dissipate all adherent moisture; and, when cool, I rub it briskly for a few seconds with a dry silk handkerchief. These operations I never perform in the room in which I coat and sensitise the plates. Holding the plate by means of a globe-holder, attached by atmospheric pressure to the back, pour on the collodion in the usual way; and when it has *well set*, without any appearance of desiccation at the upper corners, immerse it in the bath, where it remains until the solution runs off, on raising the plate perpendicularly, without streaks; then drain for a minute; and drawing the glass dipper along the back to remove all adherent

drops of the sensitising solution, place the plate, face upwards, in a flat glass bath, and pour very gently at one corner (for a stereo. sized plate) two ounces of distilled water, which move, with a gentle wave-like motion, over the plate for a minute and a half. It is then to be taken out of the bath; the back wiped with blotting paper; the globe holder applied as before; and the surface to be covered, *for a minute*, with a solution of albumen and water in equal proportions, which (with the addition of ten minims of the strongest *liquor ammoniæ* to the ounce of the mixed solutions) has been well frothed up, and afterwards filtered through a piece of sponge slightly pushed into the neck of an ordinary funnel. When the albumen has remained on the surface a minute, pour it off; drain for a quarter of a minute; then raise the plate to the horizontal position, with the holder still attached, and pour on gently, to the corner opposite to that from which the albumen has dropped, as much distilled water as the plate will hold; and after moving it backwards, with a wave-like motion, half a dozen times, pour it off at the opposite corner; repeat this operation at each corner in succession; then, resting that from which the *water has been last poured* on a piece of blotting paper three or four times doubled, and wiping the back, set it up to dry—if required for immediate use, against a tin vessel, the outside of which has been painted with a dead black colour to increase its radiation; or, if prepared over-night for use the next day, it will dry in about three hours spontaneously. The exposure, in good light at this time of the year, will be, with a stereo. lens 4½ inches focus, about 1¾ or 2 minutes. Develop (attaching the holder as before, and first moistening the collodion surface with distilled water) with

Pyrogallic acid	1½	grains.
Glacial acetic acid	10	minims.
Distilled water	1	ounce.

The development must not be pushed too far, as the colour of the deposit is very impervious to the actinic rays.

Yours very faithfully, W. L.

To the Editor of "THE PHOTOGRAPHIC NEWS."

SIR,—Observing that a correspondent, in your last number, speaks in depreciating terms of Marion's paper, I think it but justice to say that I have used it for a period of more than five years, with universal success; and have also frequently printed excellent pictures upon it, when described by amateurs as "spotty" and "bad," without any trace of such fault.

I inclose for your inspection a photograph upon their paper, printed a day or two ago, in London, with an eastward fog: and will only add that I believe most of the complaints made against paper, generally belong to the silver or hypo. bath. HERBERT WATKINS.

Photographic Societies.

PHOTOGRAPHIC SOCIETY—ORDINARY GENERAL MEETING, *2nd November*, 1858.—R. FENTON, Esq., in the chair.

After some official business, Mr. REEVES TRAER, M.R.C.S., &c., read a paper "On the Photographic Delineation of Microscopic Objects," as follows:—

"The application of the photographic art, to which the following remarks more particularly apply, is one of the most beautiful and interesting with which its followers are acquainted.

"Thanks to the modern popularisation of science, most people now know that, in each humble plant that thrives in every hedge, there exists a diversity of beautiful, minute structure, an examination of which prompts the mind to venerate, as well as to admire; while every insect—indeed, the whole of animate creation—teems with marvels for the student's eye, which shew him how wondrously the Creater's power has arranged and ordered all portions of each economy, whether of high or of low type, so that its intended functions shall best be carried on.

"To delineate, with the accuracy of photography, some of these beautiful structures, must surely be both interesting and instructive; and I regret that I have not had opportunities lately of preparing more numerous specimens for your inspection, but I trust that the few which I shall have the pleasure of laying before you will be sufficient to illustrate my remarks, and to prove how easy it is to obtain magnified representations of microscopic objects.

"The first difficulty I met with was caused by my attempts to adapt the body of my microscope to a camera. I had read of successes obtained by means of blackened tubes and, of course, tried that method, but must confess that I found it both inconvenient and unmanageable. Finally, when in Paris, I had some conversation with M. Nachet, the intelligent microscope maker of that city, and the result was that he made from my description the instrument I have ever since used, and which has thoroughly fulfilled the purpose for which it was intended.

"The chief point to be attended to in the construction of such an instrument is, to adapt the essential portions of a microscope to a camera, viz., the object-glass, the stage, the mirror, and an adjustment. These are so arranged in the apparatus which I use, that the whole screws bodily in the camera, and thus becomes entirely under control.

"The first of these essential elements—the object-glass—requires some consideration. I would advise any person about to purchase one to go at once to a good maker. He will have to pay a good price first; but as the whole success of his microscopic study depends upon the excellence of the "glasses" he uses, I am inclined to think that no one will regret the expense, seeing that he will most likely possess as good an article as modern intelligence can produce. Of the stage little need be said, except that it should be of sufficient size, firm, and furnished (if intended to assume a perpendicular position) with a "spring clip," or some other contrivance which will hold firmly the slip of glass on which the object is mounted. I am of opinion, that what are called "stage movements" are expensive luxuries, and not essential to the instrument; for with a little practice the hands will soon be found to be thoroughly educated, and capable of moving the object with the greatest delicacy. I found that the mirror originally adapted by M. Nachet was too small, and I now use one of 2¼ inches diameter. Two adjustments, a coarse and a fine, will generally be found to be necessary; the former for focussing when using the lower powers, and the latter when the higher are employed. The milled head belonging to the fine adjustment may be marked with a certain number of divisions, to enable the photographer accurately to give it any portion of a rotation that he may find necessary, should the chemical and visual foci of his object-glass not correspond. There is also an arrangement on the under side of the stage which enables me to fix an inverted object-glass in the track of the rays of light, and thus condense them on the object itself.

"I will now explain, as briefly as possible, the *modus operandi* I adopt, and from that description you will, I hope, fully understand the applicability of the apparatus I have described. Not having a "glass room" at my command, I operate in the open air, and commence by placing my camera on a firm table in the sun, so that its long axis is identical with the sun's rays, taking care to throw a light coloured cloth over it to protect it, as much as possible, from the heat. The mirror is now placed at such a distance from the object-glass as to equally illuminate the field, which, if using the concave side, I found was best done by allowing a space, slightly greater than its focal length, to intervene between it and its object, so that the rays should enter the instrument just after they have commenced to disperse; otherwise, if the object was in the focus of the mirror, I observed a bright white spot occupying a portion of the field, which quite destroyed the picture. I fancy this was caused by an image of the sun being formed nearly on the same plane as the object, and thus becoming represented on the ground glass; at any rate, I never am now troubled with this difficulty, provided I place the mirror as I have described.

"If the object-glass be a quarter-inch, or a higher power, I always use the concave mirror, and employ an object-glass of power next below that with which I intend to photograph, as a condenser. The mirror should now be arranged so as to give a circular field, and when this is *evenly* illuminated, the object may be placed in position, the proper focus found, and then all is ready for the sensitive plate. Should a very large repre-

sentation be wished, and the operator does not regret a slight loss of definition, he may place a high eye piece in the brass tube, from the inside of the camera. The large photograph of the '*Acarus*' parasite of the dry *locopa violacea* was taken under these circumstances.

"Photographic manipulation so practised by me presents nothing peculiar; indeed, it is that usually adopted in the collodion process. I need not, therefore, enter into its description, but a few remarks on the causes of failures I have met with will, perhaps, be interesting.

"The first that I had to encounter was the white spot, of which and its cure I have already spoken. The next was induced by the fact, that in object-glasses of lower power than ¼ of an inch, the foci of the chemical and visual rays do not correspond, from their being slightly over-corrected for colour; the chemical focus is separated slightly from the visual, and hence the glass must be moved a little away from the object.

"Judging from the recorded experience of others, I must be very fortunate in my glasses, for this focal difference is very slight even in the lowest powers. In my half-inch glass the imperfection has been counteracted by the addition, at its back, of a double camera lens of about four inches focal length; and I have found out by experience how much of a circle it is necessary for me to turn my fine adjustment to succeed with the low powers.

"Another difficulty which I met with was the time of exposure —that general bane of photographers. In common with other operators, I have found that, *ceteris paribus*, the actinic power of the sun's rays varies greatly day by day and hour by hour on the same day; but with collodion iodised over night, I have taken good negatives, on a clear day, in one second, sometimes in less, while, on other occasions, I have been obliged to expose my plate for seven or even ten seconds, rarely for more—be it always understood that I am now speaking of an unclouded sun. Once or twice I have curiously enough succeeded with a short exposure late in the day, with the sun within a very few degrees of the horizon.

"It may excite the wonder of some of my hearers that I have not alluded to the photography of opaque microscopic objects. I must here plead inexperience, but I am about to institute some experiments with a view of photographing the Foraminifera. The only difficulty I anticipate is that of illumination; but I think that a proper arrangement of an oblique condenser, and a little longer exposure, will enable me to succeed.

"I may, perhaps, be allowed to mention, that the collodion I now use is of my own manufacture. I confess that motives of economy prompted me to the attempt. The pyroxyline I employ is made in Paris; and it may not be without interest to add, that I sensitise with the following combination:—

Iodide of ammonium	2½ grains.
Iodide of cadmium	1¼ grain.
Bromide of potassium	1¼ grain.
Collodion	1 ounce.

"This collodion I have found to be the most sensitive I have hitherto used; I have taken good negatives (portraits) with it in three seconds, and it gives good intensity with half tone.

"And now, gentlemen, although I have not added any new fact to photographic science, I trust I have been successful in describing an apparatus by means of which photographs of microscopic objects can easily be taken; and that, in conclusion, I may be allowed to thank you for your patient attention to the remarks I have had an opportunity of making."

After some little conversation between Mr. Harding and Mr. Traer, Mr. SHADBOLT rose and said he had been for many years connected with the Microscopic Society of London, and recollected the introduction of this subject by Mr. Delves, of Tunbridge Wells. He was very glad that this subject had been brought before the Society. In the early days of photography, there was an entire misapprehension of the object of a microscopic photograph; but as the *furore* for mere details had now worn off, microscopic photography became better understood. The only difficulty in obtaining views of opaque objects was illumination. The intense white spot which Mr. Traer met with, was owing solely to the use of the concave mirror, which was unnecessary, provided a condensing apparatus was used. The usual mode of working would be by the achromatic condenser. With regard to the "stage movement," which Mr. Reeves Traer said was "an expensive luxury, and wholly unnecessary," the speaker stated, as the result of his experience, that for microscopic operations it was a *sine quâ non*. With regard to the "fine adjustment," unless it worked very smoothly, it was almost useless. (The speaker here described a fine adjustment, which was used in some astronomical telescopes; but it would be unintelligible without a diagram). With regard to the chemical focus being different from the visual, the speaker observed that he was intimately acquainted with the object-glasses of all the best makers, and it was absolutely inevitable that the chemical and visual foci should differ. In the case of the very high powers, it was not that they *do not differ*, but simply that the focal length was so small that the difference was scarcely perceptible to the eye. It would be found that if sunlight, or the light from camphine or gas were used, the amount of variation of the two foci differed with each light with the same object-glass and distance. With regard to the low powers—for an inch and a half or two inches, the amount of correction was soon ascertained for the particular light used. A correction suggested by Mr. Wenham for the low power was most ingenious, he suggested that an ordinary spectacle lens, which was, of course, under corrected, should be placed in front of the object-glass, and the variation thus corrected. (The speaker stated that he had two or three object-glasses corrected for photographic purposes in that manner.) With regard to the illumination of a microscopic object, that was a point requiring more attention than usual. With sunlight there was not much difficulty, because the rays were parallel; but his great object was to use *artificial* light for the purpose. He imagined, at first, that the more light that could be thrown on the object, the more rapid would be the action; this was found not to be the case, because, although the condensor threw a brilliant light upon the object, including as much as an angle of 90 degrees, the object glass was only adapted to take in 16 or 20 degrees, and the excess of light went to form false light in the camera. He then came to the conclusion that it would be best, in illuminating, to take a precisely opposite course close to the illuminating lamp—a small sized bull's-eye lens was placed to collect the rays of light proceeding from the flame, at a very great angle, probably 100 degrees; this was arranged at such a distance from the light that he could, by collecting as many rays as possible, fill the space of a second lens, which threw the rays nearly parallel, and the object was then placed very near to it, which made a great difference. He then found that by using, instead of that bull's-eye lens, a very small plano-convex lens of great convexity, he got another advantage. That mode of throwing the rays of light nearly parallel, or very slightly converging, would be found to illuminate the object so brilliantly and perfectly, that the amount of rapidity gained would be very great. With regard to ascertaining the amount of chemical variation, the speaker stated that an object mounted in fluid gave the simplest means of detecting it. In examining a parasite of the water rat, it was found to be studded with numerous small hairs; on focussing one of these very carefully, and then taking a picture, he could not get that hair sharp which the eye saw on the ground glass, but another nearer one, and thus, in future, on focussing for a more distant object, he could get exactly that which was required. With regard to the enlargement of the object by means of the eye-piece, of course, as Mr. Traer had remarked, nothing was gained in definition, but something of necessity must be lost; and it had another inconvenience, as it increased the convexity of the field. The speaker proceeded to say that there was another point which Mr. Traer had left without explanation—he did not communicate how he focussed his objects. If it were attempted to view objects requiring high powers, there were certain fine marks and lines which would be absolutely imperceptible upon the ground glass in the camera; and the assistance of an eyepiece would be required, in order to render them perceptible. Now the most useful adjunct the speaker could recommend, was a Ramsden's positive eye-piece. It consisted only of two plano-convex lenses, their foci being as 2 to 3, fitted with their plain sides outwards in a tube, and placed apart at such a distance, as to be equal to half the sum of their foci. The peculiar arrangement of this was, that a flat field was obtained. By means of this he could examine the image upon the ground glass of the camera, and obtain an enlargement to the amount of some 20 or 30 diameters, according to its power. A better plan than using the ground glass, the speaker said, was, to take a piece of plain glass, coat it with collodion, sensitise

wash it, and dry it, and it would present a beautiful surface, on which all the most delicate details of an object would be visible.

Mr. REEVES TRAER stated that he never found any difficulty in focussing. The glass he used was not ground, but etched with hydrofluoric acid, and he always found his object sufficiently defined on it to enable him to see with his naked eye the marks of all the objects he had produced.

Mr. GRANT, of New York, mentioned an improvement, patented by Mr. Harrison, of New York, termed the "Scroll Movement," by which the focus could be adjusted to the hundredth part of the sixteenth of an inch, without any slipping whatever. (Mr. Grant explained the mechanism by reference to a large lens adjustment.)

Mr. HUGHES stated that he was in possession of two of Mr. Harrison's lenses, which vary in their foci. He thought the coincidence of the foci was altogether an English notion.

Mr. MALONE rose and said that M. Claudet maintained that every object-glass varied with the light, and, therefore, that it was impossible to have an object-glass so corrected as to be correct in all circumstances.

Mr. SHADBOLT thought that M. Claudet was under a misapprehension, in consequence of his using a Voigtlander lens, which varies in its chemical and visual foci. He believed it to be perfectly possible to correct a lens so as to be fitted for all times and seasons.

Mr. MALONE could hardly see a probability of a lens which was corrected for white sunlight, being affected in precisely the same manner by sunlight which had passed through an absorbing medium; it was, in fact, no longer sunlight, for it had certain rays abstracted.

Mr. SHADBOLT quite agreed that the amount of correction for different sources of light, or, what amounted to the same thing for sunlight, from which some of the rays were filtered out, must be different.

Mr. MALONE said that M. Claudet found that focussing in the morning gave a certain result, but focussing in the afternoon did not give the same result. He (M. Claudet) did not attempt to define the cause, but merely suggested that the sunlight of the morning might have passed through different absorbing media.

Mr. WATSON had very frequently remarked that in the morning a lens was different to what it was in the afternoon, particularly as it got towards sunset; and if there was a tendency towards yellow, golden rays in the atmosphere, he could not get such a sharp picture as in the morning.

Mr. HUGHES said that M. Claudet was the first person who called attention to this difference in the foci. Theoretically, he thought we must take it that if the sun's rays passed through clouds, of necessity they passed through a medium which extracted some of the rays, and the same thing happened in passing through the glass of our own rooms. If this variation were sensibly and materially to interfere with our arrangements, it would render it necessary to readjust our instruments every day and hour. A great deal had been said about the difference of foci, and he believed very excellent lenses had been condemned simply because they had not agreed. He had worked (and others had done the same for many years) with lenses that did not agree. He thought it merely a question of cabinet work. Lenses that were constantly being sold as having their foci coincident, only coincided at certain distances; if those distances were exceeded, their foci varied exceedingly.

The CHAIRMAN called attention to the various specimens produced by the oxymel and by Fothergill's dry process. There were also some specimens produced by Mr. Fox Talbot's new method.

Mr. MALONE then rose and said that, in consequence of the publication of Mr. Fox Talbot's specification of the modification of his former patented process of engraving, he thought it would be interesting to bring some specimens which had the same basis to start from. They were by Poitevin, of Paris, and he thought they would bear comparison with any results which had been produced. They were photo-lithographs, produced by coating the stone with a mixture of bichromate of potassa and of gelatine, or of bichromate of potassa and white of egg. The object to be copied was then placed upon a stone so prepared, and the light acted in such a manner that afterwards, upon applying water, it should only wet the unexposed parts, as was the case upon the ordinary lithographic stone. The surface appeared to be altered in such a manner that it would receive the printer's ink, when the paper had simply to be placed upon it and be passed through the ordinary lithographic press, and thus printed without any engraving or loss of time, and have the result at once. It would be seen that this was an object that could be carried out upon a large scale. (Several specimens were here handed round by Mr. Malone.) This process had been patented in this country. It certainly seemed to be a process of very great promise. It had been suggested that the chromic acid, under the influence of the light, oxidised the gelatine in such a manner as to give rise to a resinous substance, and Dr. Frankland informed him (the speaker) that he thought a resinous substance was formed which resisted the water on the stone, but allowed the adhesion of the printer's ink.

The CHAIRMAN then read the following paper on Carbon Printing:—"The method I find quite easy is as follows:—I make a solution of gum arabic in water, about as thick as molasses; with this I grind, on a glass or in a mortar, a sufficient quantity of calcined lamp-black, ivory-black, or other pigment. When the mixture is thorough, I add, in the dark, an equal part, by measure, of a saturated solution of bichromate of potash, in honey, diluted with an equal quantity of water. The whole is now to be carefully mixed by stirring or grinding. This intimate mixture is a point of the greatest consequence. The paper I prefer is the slightly albumenised. The mixture is laid on by floating, or with a large flat brush. Dry in the dark. The printing is performed in the usual way, only using about half the time for ammonia-nitrate paper. After exposure, the print is soaked ten minutes or more in water, and then exposed under a stream of water until the whites are fully brought out." The Chairman said that he should be very glad if this matter could come before the Society upon another occasion, and suggested that the subject should be brought forward at the next meeting.

Photographic Notes and Queries.

DARK MARKS LIKE STREAKS OF MUDDY WATER ON THE NEGATIVE.

SIR,—In reply to your inquiry on the above point, in vol. i. p. 95 of the "NEWS," I believe the marks alluded to will be found to arise from the quantity of *ether* contained in the bath, from the dipping of many plates.

To avoid this inconvenience, let the bottle containing the bath be put (without its stopper) up to its neck in a jug containing *hot* water, for twenty minutes or half an hour; the ether will evaporate, and the bath then work as usual.

J. W. WHELAN.

VARNISH FOR NEGATIVES.

DEAR SIR,—Amongst the numerous useful hints which are to be found in the "NEWS," I have seen no formula for a varnish for collodion negatives at all equal to one which I am in the habit of using. The requisites for a good varnish for this purpose should be—to be sufficiently fluid for it not to give too much translucency to the negative, and thus lose vigour, and yet to be thick enough to preserve the film effectually; it should also be hard enough to bear reiterated rubbing, and should soften at a moderate temperature.

Take 100 parts of ordinary alcohol, and add 8 parts of oil of lavender and 5 of gum lac; dissolve by the aid of heat, and filter. In another bottle place 30 parts of chloroform, 5 parts of powdered amber, and about an equal quantity of broken glass to divide it: leave the mixture to digest for several days, in a warm place, shaking it occasionally, and finally decant the clear portions into a perfectly dry bottle. Take 2 parts of the alcoholic and 1 of the chloroform solution, shake them together, filter, if necessary, and the varnish is made. To use it, slightly warm the glass by a spirit lamp or fire, and when it has reached a temperature which can be just borne when the back of the glass is pressed to the lips, pour the varnish on and off, as if it were collodion, but not so rapidly, and after draining the excess into the bottle, hold the plate vertically and slightly warm it, increasing the heat as it gets dry in order to obtain lustre.

The advantages of this varnish are: it perfectly protects the film without sensibly increasing its thickness; it does not soften in the sun; it does not diminish the vigour of the negative; and finally, it so protects the surface that the negatives may be kept in a portfolio or wrapped up in paper.

SPHYNX.

COLLODION ON PAPER.

SIR,—Allow me through the medium of the "PHOTOGRAPHIC NEWS" to draw attention to a very valuable plan of taking collodion pictures on paper instead of glass. I learned it some years ago from a gentleman who communicated it to the pages of a periodical, but I cannot now lay my hand upon it. I, however, send you the plan, and recommend it to the attention of your readers. Cut a piece of fine thin paper, a trifle smaller than your glass plate. Coat the latter with collodion in the ordinary way, but before it has set, take the paper and lay it on the collodion side of the plate, taking care that no air bubbles remain underneath the paper; should any be there, they must be carefully pressed out with a thin paper knife. When this is done, recoat the whole with collodion, and proceed as in the ordinary way, allowing it, however, to remain for about double the usual time in the bath. Expose the regular time, and develop, &c., as in the collodion process, taking care to wash the hypo. off more carefully and with plenty of water, as the paper will be likely to hinder the washing. When finished, loosen the edge of the collodion, and carefully take the paper off the glass. It may be waxed, if necessary.

A great advantage of this process is the length of time the plates retain their sensitiveness. I frequently keep them four or five hours and cannot detect any deterioration.

I think if your readers would try the above plan they will not often find any necessity for any dry process, for, after all, the *first few hours* are all that it is absolutely necessary to keep a plate, except on rare occasions; added to this, the formidable accumulation of heavy glass plates is avoided, and fifty negatives can be packed up in a portfolio and stowed away in a carpet bag with no more special attention than the tourist would bestow upon a clean shirt.

ALPHA.

TO HOLD THE SENSITIVE CALOTYPE PAPER IN THE DARK SLIDE.

DEAR SIR,—I have much pleasure in forwarding the following method of holding sensitive calotype paper in the dark slide, for the benefit of your correspondent whose query on the subject is printed at page 82 of the "NEWS."

Attach three or four pin points to each inner edge of the back of the dark slide, and make corresponding holes in the margin of the frame to allow them to drop into. When the damp calotype paper is ready for insertion, draw up the sliding shutter, open the back of the dark frame, and place it over a piece of deal, cut to the size of a corresponding thickness, with the inner margin of the frame. Lay a piece of white blotting paper upon the deal, then the prepared paper cut to the size of the back shutter, and finally close. The pin points will pierce the paper, and the frame can be lifted away from the piece of deal board, when the sliding front must be shut down. It is more convenient to have the back shutter detached than hinged to the frame.* As soon as the paper has partially or entirely dried, it will be found to be held most securely in the frame, and to be stretched in its proper place without a wrinkle or crease of any kind. The image falls on the sensitive surface without the intervention of glass or the application of any adhesive substance to its edges, and, when required to be removed, can be instantly disengaged. The above mechanical contrivance I found to answer perfectly, but for some time past my ardour for talbotype experiments has vanished before the fascinations of collodion.

THOMAS SEBASTIAN DAVIS.

* Of course the back shutter must be perfectly flat, and have no projecting spring in its centre.—ED.

ON THE PREPARATION OF THE DOUBLE IODIDE OF POTASSIUM AND SILVER.

SIR,—May I ask your attention to the following—

Problem.—The collected washings by agitation of precipitated iodide of silver from its nitrate is of a dense milky appearance, and does not give a clear supernatant solution of nitrate of potash, although at rest for two or three days; how to separate the minute particles of iodide of silver from the liquid?

Answer.—Take *well washed* precipitated alumina and add it to the liquid, agitate two or three times and allow it to subside each time; after the lapse of some hours the alumina has completely subsided, carrying with it the iodide of silver, pour off the supernatant clear solution of nitrate of potash, and add distilled water to the mixed precipitate of iodide of silver and alumina; then add a few grains of tartaric acid, and well agitate several times, which will redissolve the alumine from the iodide of silver.

The above problem occurred in my practice when following the excellent directions of your contributor *Theta* to make the double iodide of potassium and silver for the Calotype Process. I have no desire to tamper further with, and perhaps render useless, materials which cost 2s. or 4s. 6d. per ounce, and I wish therefore the favour of your assurance that my answer is correct. I do not say the best, but is it correct; and is alumina the only portion of the ingredients which is dissolved?

C. B.

[Our Correspondent is quite correct as far as the chemical decompositions go; the alumina would be the only portion of the precipitate which would dissolve; but what is gained by the above plan? The iodide of silver has now to be separated from tartrate of alumina instead of nitrate of potassa, and for either of these purposes the simplest plan would be to pour on a filter and well wash with distilled water.]

GLASS POSITIVES IN LOCKETS.

SIR,—Amongst answers to "Minor Queries" in your "NEWS" for 8th October, I see one to E. M.

As our friend seems to have no other objection to the glass than the difficulty in cutting it to fit the locket without destroying the picture, I think I can put him on a plan to overcome it.

The glass is cut to the required size and shape for the locket, polished on the edges, &c., and is then stuck, by means of a rub of heated gutta percha, to the centre of an ordinary glass plate, which thus serves for a plateholder to it. It is coated, excited, exposed, developed, washed, &c., in the usual way, and by the edge of a knife detached from the large plate.

Of course a pencil-mark should be made on the ground glass corresponding to the size (and position) of the small one (on the large), and allowance must be made in focussing for the thickness of the glass.

Excuse me if I have misunderstood E. M.; but this may be of use to others. Simple, but might not occur to many.

J. F. M.

ANSWERS TO MINOR QUERIES.

THE STEREOSCOPIC ANGLE.—*L. L. B. Cantab.* The appearance of relief in stereoscopic pictures depends upon the lateral displacement of the objects in the foreground with respect to those behind them. The distance between the two lenses is therefore a base-line, and the longer this is, the more exactly can the eye perform the necessary trigonometrical survey of the view in the stereoscope, and thereby judge of the different distances of the objects. In a twin stereoscopic camera this base-line is only from 2½ to 4 inches, and, consequently, the relief will only be small for distant objects. Many persons object to a wider separation in the generality of cases, on account of the diminution it causes in the apparent size of the objects, a very long base-line causing the resulting pictures, when joined in the stereoscope, to look like a little cardboard model of the view.

PHOTOGRAPHS OF INTERIORS.—*Alfred N.* We have seen

very good photographs of interiors taken by almost every process. The requisites are:—1. A good double lens, with either the full, or a tolerably large aperture. 2. A sensitive surface which will keep for some time; such as a plate prepared by one of the dry processes, or a sheet of calotype or waxed paper. We should, however, first of all try wet collodion, as, if the light happened to be very good, it would keep sensitive quite long enough to take an impression. 3. Plenty of time. Arrangements should be made for remaining in the building (or, at least, of allowing the camera to remain there) undisturbed for a whole day, or even longer if found necessary. We once fixed up our camera, exposed the plate, and then pocketed the key; *a week* afterwards, considering the plate had been exposed long enough, we returned, and, on developing, obtained a very good picture. It must, however, always be remembered in these long exposures, that there is no strongly illuminated part in the subject to be copied. A brightly illuminated projecting piece in the architectural ornaments, not to mention shining surfaces of metal, or the direct light of a window, would be fatal to the plate.

Negative Paper Process sufficiently Sensitive for Portraiture.—*C. N. P.* wishes to obtain a paper process sufficiently sensitive to take negative portraits. We have met with the greatest success in this line by following Mr. Talbot's calotype process, with some modifications, which are necessary when foreign paper is used. Take French or German thin photographic paper, and cut it about an eighth of an inch smaller all round than the glass plate which fits the collodion slide. Mark the smoothest side, and float that side on the following solution:—

Pure iodide of potassium	20 grains.
Pure chloride of sodium	5 "
Distilled water	1 ounce.

After remaining on this bath for about half a minute, remove the sheet, and dry it between perfectly clean white blotting paper; and having poured a little of the following solution on a clean and level glass plate,—

Pure nitrate of silver	50 grains.
Glacial acetic acid	1 drachm.
Distilled water	1 ounce.

Float the paper face downwards on it, and allow it to remain for about one minute. Meanwhile, take a piece of glass which will fit the dark slide, clean it well, and having levelled it, lay on it a piece of clean wet blotting paper of the same size as the prepared paper. Now pour a little distilled water on the blotting paper until it is *very* wet, and, removing the sensitive paper from the glass of aceto-nitrate of silver, lay it carefully, *face upwards*, on the wet blotting paper, guarding against inclosing air bubbles while laying it down. It will now be found to stick firmly to the blotting paper. Rest it now, face inwards, against an upright board, letting it stand on two or three thicknesses of blotting paper; and when it has thus drained for a minute, place the glass and paper in the dark slide as if it were a collodion plate, and expose in the camera so that the sensitive surface of the paper is next the lens, no glass intervening. The exposure, although longer than collodion, will be far shorter than the ordinary paper processes; and it should take place as soon as possible after the preparation of the paper. When exposed, remove the paper from the supporting piece of glass, and place it, face downwards, upon another glass plate, which has on its surface a small quantity of a saturated solution of gallic acid. The picture will soon begin to appear; and will develop rapidly, and with great intensity, provided the right exposure has been given. When developed, fix in hyposulphite of soda, and wash thoroughly in water in the usual way. When finished, it may be washed, in order to increase the transparency. As all the above operations should follow each other with tolerable rapidity, it will be as well for the experimenter to have all the necessary materials ready before commencing.

To Remove a Stopper from a Bottle when Fixed.—*W. H. H.* Several plans have been suggested for removing stoppers when they have become fixed in the necks of bottles. One plan is, to grasp the upper part of the bottle firmly in the hand, and then pressing the stopper sideways by applying the thumb to its narrow side, gently tap it in the opposite direction to that in which the thumb tends to force it, by means of the handle of a chisel or file, the iron portion of the tool being held firmly in the hand. Should this plan not prove effectual, apply a gentle heat to the neck for a few moments, so as to expand it, without expanding the contained stopper, and then repeat the tapping. Another plan is to select a key, the handle of which will just slip on to the wide part of the stopper, and then, having placed a piece of leather, or a few folds of a pocket handkerchief over the stopper, squeeze the key on, and exert a gradual force until the stopper is loosened. Of course if the stopper *won't* come out by this means, it will break off, and so this plan should only be tried as a last resource; and, although we have found it successful with many hundreds of refractory stoppers, our breakages through its means have not amounted to half a dozen. In some cases, particularly if the bottle contains collodion or other inflammable liquid, the neck had better be heated by friction, instead of the direct flame; to accomplish this, pass a stout cord once round the neck of a bottle, and having tied one end to the knob of a drawer, or some such thing, draw the other end tight by the left hand, and, holding the bottle in the right hand, rapidly move it backwards and forwards; the friction of the string round the neck will soon produce a sufficient degree of heat. If the stopper has been fixed in a bottle by the crystallisation of any substance between the stopper and the neck (as frequently happens to the bottle of collodion *iodising solution*), place a few drops of water, or other solvent, round the edge of the stopper, and allow it to remain for a day or two, renewing it when necessary.

TO CORRESPONDENTS.

Agate.—Try glycyrrhizine in the nitrate bath, as recommended previously.

Secundus.—We have seen some beautiful prints taken by Mr. McCraw, and hope soon to give fuller particulars of the process.—The exact preparation of the dry collodion plates is, we believe, kept secret.

A Subscriber.—Of the two positions marked on the plan, we think the red is the best, as the sun would be on it all day. Make the room as large and lofty as you can.

Subscriber, D. N.—The price you name is sufficient for what you want; but we cannot give you all the desired information.

T. C.—If the paper be already albumenised, it need not be so prepared a second time. First wash, then tone, then fix.

An Iron Plate is recommended to add a few drops of acetic acid to his bath.

S. D. S.—We cannot recommend any particular kind. We are much obliged for the information; it is not a new plan, but is of very limited value.

A. B. C.—We hope soon to have an article on the subject.

H. H.—Perhaps W. L.'s letter on Fothergill's process will give you the information you want.

G. W. R.—We have never heard of *alabastrine* photographs fading. It could only happen, we should think, through insufficient washing.

J. C.—4 ounces of hypo. to 12 or 16 ounces of water. *Tin* is recommended, as the turpentine effluvia from deal will injure the plates.

W. H. H.—You will not be able to get good portraits with a single non-achromatic lens. Try *views* only, and use a ¼ inch aperture.

No. 35, W.—1. We cannot guess at a reason for the curious effect you name. Try if any modification in the degree of acidity of the bath will remedy it. 2. Add two drops of nitric acid to the bath. 3. Try the plan given in at p. 32. 4. Add one to each ounce of the developing solution.

Negative.—Fothergill's is the chief favourite just now.

Photo. Novo.—High legal authorities are divided in their opinions as to the state of the law of artistic copyright as applied to photography.

E. H. P.—We are much obliged for your having called our attention to the subject; it shall be attended to.

A Constant Student.—Articles on the subject are in progress, and will shortly appear.

Paleographer.—Fothergill's or other dry processes will answer your purpose best. If you object to the smell of the collodion in their preparation, you can purchase them ready for use.

Prestonian.—The larger the aperture, in proportion to the focal length, the quicker will be the lens, if other circumstances are equal.

An Amateur, 15.—We are very pleased with the colours you have produced, and should much like to have further particulars. Try a less exposure.

Negative, C.—Consult our advertising columns; if the information is not to be obtained there, write to some large firm.

P. H. T. R.—1. Previously answered. 2. It will not injure the collodion.

Cyanide.—We have never tried the process you name.

Communications declined with thanks:—R. F.—W. C.—Thomas W.—Lamp.—F. R. C. S.—Toning Bath.—X. Y. Z.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—H. S.—Darkie.—C. S. W.—E. A.—G. L. T.—R. S. T.—A. C.—G. K. Q.—An Amateur Painter.—F. A. D.—Paper.—A Correspondent.

In Type.—Ajax.—E. W. B.—A. M.—Euphes.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 10.—*November* 12, 1858.

OUR PHOTOGLYPHIC ILLUSTRATIONS.

WITH the present number of the "PHOTOGRAPHIC NEWS," we present our readers with a specimen of Mr. Fox Talbot's new process of photoglyphic engraving. We had originally intended to have printed all the specimens from the same plate, and thus to have given, with each copy of the "NEWS," the same picture; but several circumstances have induced us to deviate somewhat from our first intention—there being not only one, but a variety of specimens issued; and although with each number of the "PHOTOGRAPHIC NEWS" there is only one plate presented, should any of our readers wish to possess other subjects besides that given, they can be obtained by purchasing extra copies of this number, and specifying the plates he may wish to have. Various reasons have induced us to adopt this plan. First: Our circulation is so large that, with one plate, it would have been very difficult to have got a sufficient number of specimens out in time. Second: The present plan will, in our opinion, more fully attain the object we have in view—of giving the public some idea of the extent and variety of this new branch of art. Third: We are enabled to present more choice proofs than we could under other circumstances; for it is evident, that when many thousands of copies are printed from the same plate, it gradually wears out—the last thousand prints being less sharp and delicate than the first. But by our present plan of having several specimens, we need only issue the earlier prints from each plate.

The public, of course, do not expect specimens of an art only a few weeks old to be free from faults. They wish to see it in its present state, and by these specimens they will be better enabled to judge as to its future capabilities. With that object in view, we wish now distinctly to state, that these specimens are *entirely untouched*, and are presented exactly in the state in which they were obtained by the process described in our seventh number. No doubt many corrections, as well as improvements *ad libitum*, might be introduced, if it were desirable, by a skilful artist; but this would entirely defeat our object, which is, to show that photography and chemistry combined promise to accomplish for us many results which have hitherto been supposed to demand artistic skill. The great object, as a contemporary has it, is to "make Apollo his own engraver." We merely see at present the commencement of a new art, the future of which it would be difficult to predict with any amount of certainty; but there can be no doubt that its application will ultimately be great and varied.

The accompanying specimens must not be taken as a criterion of the size which the photoglyphic process can be carried to; its manipulations, like photography itself, being purely mechanical, the magnitude of its results is only limited by the materials employed; and the reason why the present subjects are no larger is, that they were from the best specimens of transparent glass positives obtainable. Most of our readers will perceive that the views are taken from those published by MM. Clouzard and Soulier, the celebrated French photographers, who are almost unrivalled in the perfection of their stereoscopic transparencies; and we do not think we are premature in announcing, that these gentlemen are so interested in this new invention that they are preparing some large views of Paris, expressly for the purpose of being engraved in this manner; and we have the pleasure of stating, that as soon as these large views are ready engraved, our readers will have another opportunity of judging for themselves of the progress which this beautiful and wonderful art is making.

The titles of the pictures issued with this number of the "PHOTOGRAPHIC NEWS" are as follows:—

1. Bridge over the Moldau, Prague.
2. Congress of Deputies, Madrid.
3. Court in the Alhambra, Granada.
4. Palace of the Duc de Montpensier, Seville.
5. The new Louvre, Paris.
6. The Gate of the Cathedral of San Gregorio, Valladolid.
7. The Institute of France.

In our third number we have given a description of some of these plates; we shall therefore now confine ourselves to general remarks upon them. In looking at an ordinary engraving it will be seen, that it must be viewed at some little distance in order to get the general effect of the whole—a close, or microscopic inspection, only showing a number of lines or dots. In photoglyphic engravings, however, we have breadth of effect at a distance; and besides that, by close examination with a magnifying glass, they appear actually more wonderful, as we thus view, instead of crude lines or dots, so astonishing an amount of detail, that nothing less than a personal inspection will enable any one fully to appreciate it. It will be also seen, that there is a beautiful gradation of distance—the middle or half-tints being, at the same time, very distinct; this (the production of a perfect half-tone) being the point upon which all other similar processes have failed. The pictures which best show the beauty of half-tint are Nos. 2, 5, 6, and 7; those in which we have the gradation of distance, Nos. 1, 3, and 4; and those in which microscopic detail is most strikingly to be seen, are Nos. 1, 4, and 5. It will be evident, that subjects of such extreme minuteness, when printed against time, require more than ordinary care in order to obtain good impressions. This has been well attended to by Mr. Brooker, of Margaret-street, Cavendish-square, to whom has been intrusted the printing of these specimens.

In conclusion, we are sure that we shall only be giving expression to the sentiments of our readers when we state, that our and their thanks are due to the kindness and courtesy of Mr. Fox Talbot, for having thus kept us so perfectly *au courant* with the most recent advances of photo-chemical research.

THE STEREOSCOPIC ANGLE.

SIR,—Your correspondent, Mr. Lake Price, appears not to have seen the beautiful stereographic photographs of the moon obtained by Mr. Delarue, taking advantage of the difference of presentation of its globe to the eye in opposite states of libration, as suggested by Mr. Wheatstone, of whose admirable invention of the stereoscope this must be looked upon as the crowning triumph, being, in effect, a step out of and beyond nature. When taken on glass, and seen transparent, nothing can exceed the perfection with which the spherical form and *unity* of object comes out, while the two pictures, viewed alternately with one and the other eye, differ so widely, both in the apparent forms of the spots and in their lights and shadows, that it seems almost inconceivable how they can ever be brought into harmonious consistence.

The mean effect of the moon's monthly libration in longitude is, to displace a spot from her apparent centre around six degrees and a quarter on her own surface; and this, taking place in one situation to the east and the other to the west, produces a total apparent change of place of about twelve degrees and a half, which is the "stereoscopic angle" in this case, and which corresponds at the distance of the earth to a lateral shift of the point of view or of the photographic camera of about 6½ diameters of the earth, or 52,000 miles: so that this stereoscope exhibits the moon to us as it would be truly seen by a giant whose eyes were that distance asunder, if stationed at our distance from it.

As the sun turns on its own axis absolutely in about twenty-five days and a half, and relatively in about twenty-seven and a half, a spot on its surface will shift its place in twenty-four hours about thirteen degrees on that surface. Two photographs, therefore, taken about the same hour on consecutive days, ought to give an equally perfect stereograph with that of the moon above mentioned; and as the spots very often remain but little altered in size and figure during that interval, it can hardly be but that such stereographs taken in favourable opportunities, when large spots are approaching the edge, will suffice to decide by ocular inspection the long mooted question, whether they be really depressions or pits in the sun's photo-sphere or not.

In reference to the subject mooted in your reply to L. B. B. CANTAB, I would observe that a person with a moderately good sight can perfectly well see a solid object *as* a solid, *i.e., stereographically*, at five inches from his eyes. Taking the distance of the eyes at two inches and a half, this gives a stereoscopic angle of a little more than 28°; which is perhaps the extreme of what ought even to be attempted, and that of course, not for artistic purposes. An angle of eleven degrees and a half, which would correspond to a lateral removal of the camera by one fifth of the distance of an object *(however great)*, would, therefore, afford an *excellent visible model* of it in the same relief as if a real model in true proportions, subtending the same visual angle, were placed at twelve inches and a half from the middle point between the eyes—a distance allowing every detail of structure to be most accurately scrutinised, especially if aided by magnifiers.—I remain, sir, your obedient servant,

J. F. W. H.

Collingwood, Nov. 6. 1858.

PHOTOGRAPHIC ATLAS OF THE MOON.

BY P. SECCHI.

AT a recent meeting of the Academy of Sciences the gentleman, whose name appears at the head of this paper, presented an atlas of the phases of the moon, photographed by means of the great Mertz telescope, at the Roman college.

"The diameters of the moons," he says, "are twenty centimètres. The manner in which they were obtained was, by taking a negative proof on collodion forty-five millimètres in diameter; the image was afterwards enlarged with the assistance of a great solar microscope, and in this way a positive proof was obtained on albumenised glass of the desired size. From this positive proof a negative was obtained for printing the picture on paper. The actual dimension represents the moon as it is seen in a telescope magnifying 90 or 100 times, and this size was not exceeded, because if it were, the irregularities in the surface of the paper would equal the inevitable irregularities of the picture, produced by the inequalities of the albumenised and collodion film. These photographs produce an excellent effect when regarded with a glass, magnifying eight or ten times, under a rather powerful light. The conclusions which science may draw from these pictures appear to me very interesting:

"1. I remarked some time since, the enormous difference in the time of exposure required to obtain the moon in its different phases: thus, seven minutes is necessary for the phase of four days, and only twenty seconds for that of the full moon.

"2. The difference of the luminous intensity in the different parts is very great. In the full moon, to have a sufficiently sensible distinction between the different regions of the surface, we limited the time of exposure, as I have already mentioned, to twenty seconds; but while the *mountains* are white the *seas* are almost black. This effect, which is very visible in the moon at night, disappears in the moon seen by daylight; in fact, looking at this luminary while the sun is still on the horizon, the mountains will be seen very clearly on the blue ground of the firmament, while the seas have the same intensity as the terrestrial atmosphere, and, owing to that cause, are invisible. From thence flows a result, perhaps, unexpected in photometry, which is, that the light of our atmosphere, enlightened by the sun, is equal to that of the more sombre parts of the full moon during the night. The same effect reproduces itself in an almost equal degree in the phase of the tenth day, when the crater *Copernicus* appears isolated from all the surrounding parts, which, nevertheless, were enlightened, but the chemical intensity of which is rather feeble, because they belong to the smooth parts.

"3. The lunar images were taken in the months of March and April; in the summer months it was impossible to obtain anything satisfactory, in consequence of the great vividness of the light of the sky, which sometimes even produced reversed images. Hence a very great difficulty in the way of taking pictures of the moon in its earliest phases, the moon being then always immersed in crepuscular light. The atlas gives the 4th, 5th, 6th, 7th, 8th, 10th, 12th, and 14th days. We have omitted some days because the details of the lunar surface are obtained much better in her diminishing phases on account of the great quantity of the smooth and ineffective parts.

"4. These details are interesting as applied to the theory of lunar formations. We shall observe, and not without interest, the vast radiations which spread from the principal craters—especially Tycho, Copernicus, and Kepler. The first is so marked that it gives to the moon the aspect of a globe divided by meridians, the pole being in the centre of the crater itself.

"5. A very remarkable circumstance presents itself in the photographs, which at the first glance appears to arise from imperfection in the execution: it is a kind of indecision of the pictures, and a dispersion of the light in the neighbourhood of the spots, which one is inclined to attribute to a movement of the image, especially in the full moon—but to do so would be erroneous. In fact, this diffusion around the clear parts commences from the tenth and twelfth days, when the well-defined small craters prove the precision of the image. It appears, therefore, that this arises from a stronger illuminating action, which has its source in the asperities which necessarily surround each crater." (The author here appends the following note: —"It would indeed be impossible to obtain an exact phase without the other, for after having found the chemical focus in the lunette, a point of datum was fixed

to find it immediately. This focus was seventeen millimètres more distant than the optical focus. If there is some indecision in the image, that arises from the agitation of the air, and to the movement of the image which ensued, which produced an extreme difficulty, and we were obliged to reject many proofs made on the evenings when the atmosphere was agitated.")

"The photographic execution of the lunar pictures was performed by M. François Barelli, a Roman *pharmacien-chemiste*, and a distinguished amateur in photography. To insure the success of so many phases, it required extraordinary perseverance on the part of the photographer, as well as great intelligence."

ON URANIUM PRINTING.

BY M. CRESPON.

M. Crespon adds the following information to the paper which we published in a recent number of the "Photographic News." Referring to some proofs forwarded to the French Photographic Society, he says:—"These proofs were obtained on paper prepared with the nitrate of uranium without gelatine; the sheet remained ten minutes in the bath; the exposure to the sun was from three to twelve minutes, according to the intensity of the negative proof. The development of the positive picture was with the nitrate of silver alone; the toning was with the *sel d'or* of Fordos and Gelis, and not with the acid chloride of gold. With the latter we do not obtain the beauty and vigour of the blacks which the first gives. Thus, one of the proofs which was obtained by M. de la Blanchère's process, and which was toned with the acid chloride of gold, without being submitted to the hyposulphite, has two drawbacks,—it is not fixed, and does not present the modelling and the shade which in another case was obtained with the same negative, and by my method of fixing and toning.

"It is important not to submit the proof to the hyposulphite of soda until after toning, or it will be wanting in sharpness. Nevertheless the latter method may be employed when the proof has been exposed to the sun for too great a length of time, and is, in consequence, too heavy and dull; and, in this case, the acid chloride of gold may be used for toning, which brings it to a pearl gray tone, pretty enough to look at. The longer the proof, when well developed, is submitted to the action of the *sel d'or* bath, the greater the vigour of the tones when withdrawn from the hyposulphite of soda. A short stay in this toning bath gives proofs which are not wanting either in softness or agreeable appearance."

OBSERVATIONS ON THE PREPARATION OF COMMERCIAL CYANIDE OF POTASSIUM.

BY MM. FORDOS AND GELIS.

Many processes have been proposed for the preparation of cyanide of potassium, but only three have been adopted in chemical manufactories—those of Robiquet and Wiggers, which give the medicinal cyanide, and that of Messrs. Rodggers, Brothers, known under the name of Liebig's, which supplies the product employed in the arts. Messrs. Fordos and Gelis have analysed the cyanide sold in commerce by different houses, and have invariably found it so impure, that they can only attribute it to a bad method of preparing it. A dozen specimens bought at random, and submitted to certain tests, which gave easily and exactly the richness of these products intended either for medicine or commerce, furnished the following per-centages:—55, 46, 49, 51, 36, &c. Some cyanide which they had themselves prepared with great care, according to the process in ordinary use, yielded only 57 per cent.; in other words, it contained 43 per cent. of foreign products, arising from unknown causes: this formed the subject of the labours of the two chemists.

First of all, we will remind our readers of the process employed by Messrs. Rodggers, or of Liebig, under whose name it is known. Take eight parts of dry prussiate of potash, and three of dry carbonate of potash; that is, exactly an equivalent of each of the two substances and heat them to redness. The melted mixture yields a transparent liquid, which, after being allowed to stand, can be easily poured off from an abundant deposit, and, on cooling, becomes a white mass. This mass, according to Liebig, is a mixture of two combinations—cyanide of potassium and cyanate of potassa in the relation of five equivalents of cyanide of potassium for one equivalent of cyanate. This ought to contain 80 per cent. of cyanuret, but, as has been seen, it is very far from being so rich as that; and, moreover, at each repetition of the melting, a different result is obtained, so that we might say a different product is given on each occasion.

Messrs. Fordos and Gelis came to the conclusion that it was advisable to give up Liebig's process, and to replace it, in all circumstances, by that of Robiquet, with certain modifications suggested by Geiger (*Annales de Physique et de Chimie*). As to M. Wiggers' process, which presents some difficulties in manipulation, these chemists aver that it is quite a mistaken idea to suppose that it yields pure cyanide of potassium. "Of numerous specimens we have analysed not one has indicated a greater richness than 85 per cent." The loss, in this case, should be attributed to the action of the water and the air during the desiccation of the product separated from the alcoholic liquor.

In conclusion, Messrs. Fordos and Gelis have pointed out many important things. They have ascertained the reason why a cyanide of potassium cannot be obtained which does not contain, at least, one-fifth of foreign matter—and there their revelations cease; but if they have indeed discovered, as they assert, a mode of preparing it, by which it is always pure and identical, they keep the secret to themselves.

NEW METHOD OF PRODUCING TRANSPARENT STEREOSCOPIC POSITIVES.

The process of M. Gaudin which we are about to describe is not altogether new, but it is rapid and economical; and can be practised by all who are accustomed to the use of collodion.

There is no necessity for the collodion being new; on the contrary, an old collodion which has lost much of its sensitiveness is better adapted for the purpose: consequently, it is advisable to preserve the collodion residues, and put them in a bottle, and add a little pyroxyline for the purpose of restoring the tenacity it has lost, and, at the same time, to give it twice the thickness of an ordinary sensitised collodion. It should be allowed to stand until the following day; filtered through cotton; and used in collodionising a glass plate in the usual manner. The plate must then be put in the silver bath in the same way as if it were desired to take a negative. The negative to be copied must then be placed in the frame (that belonging to the camera would answer the purpose), and the collodion plate laid upon it; the door of the frame must be closed, and it ought to have two springs corresponding to the centres of the stereoscopic proofs, in order that the contact between the two plates may be immediate; then, opening the two little opposite doors, the plate should be exposed to the action of daylight for a quarter of a second in the day, and from one to two seconds in the evening, according to the sensitiveness of the collodion. This done, the frame is carried into the dark room, and the plates, which adhere to each other, taken out, and separated—by means of a thin piece of wood introduced between the edges, and used as a lever—very gently, in order that the moist collodion film may not be injured; it may be developed by the ordinary process. Supposing the proof is very large, so that there is risk of injuring the sensitive surface, a ground glass may be used, the inequalities in the surface of this glass causing the collodion to adhere more strongly. It is also desirable that the surface should be perfectly plain, but it is not absolutely essential.

Before contact with the collodionised plate the negative must be varnished; and, after contact, water should be poured over it rapidly, and then it should be lightly wiped.

PHOTOGRAPHY IN ALGERIA.

NO. III.—(*continued*).

No opportunity of getting any picture worth preserving occurred after this until we reached the immediate vicinity of the mountain where the Kabyles had taken up their position. By this time the soldiers were very tired, for though the weather was not nearly so hot as it was two or three months ago, yet it was still hot enough to tell upon one in the desert; and their commanding officer therefore decided on deferring the attack until the following morning at daybreak, notwithstanding the impatience of the men to "go in" at once. The mountain was not of any great height, nor difficult of ascent at the lowest part; but we could easily see, that as soon as the first sixty or seventy yards had been got over, the sides of the mountain would be rugged and difficult to ascend. Fragments of rock lay loosely about the sides, which were pretty thickly covered with low shrubs, forming an excellent cover for the natives, and admirably suited for their mode of fighting, which resembles the method practised in the mountain warfare during the peninsular war, and doubtless suggested to them by these very facilities. We saw no indications of any living being on the mountain when we arrived near the foot of it, but the men had no sooner commenced to pitch their tents, and thus reveal their intention not to attack that night, than I noticed a figure rise up here, and another there, and very soon there were so many visible that if every bush had been as prolific as the wooden horse of Troy, they could not have brought forth more ready-armed warriors. Derisive shouts were uttered by them, and every now and then a fellow, more of a *fanfaron* possibly than his comrades, would descend the mountain, so as to come somewhat nearer to us, and pour out a volume of defiant language, in which the opprobrious terms Kaffir and Roumain were alone intelligible at the distance we were from him; and when he had finished, he would discharge his gun towards the outpost, go through a considerable amount of pantomime, expressive of his contempt for us, and then rejoin his comrades. The whole thing reminded me of the scenes before the walls of Troy. The soldiers were all this time busy in pitching their little tents and getting their food ready, and paid not the least attention to this vapouring of the Kabyles; and though it would have been easy enough, I have no doubt, to have knocked over one or two of the most boisterous of these gentlemen, no attempt was made to do so, and I did not notice any desire on the part of even the youngest soldier to engage in such petty warfare. I noticed a surprising difference in the conduct of the men on this evening to their behaviour on the march. There was no noisy levity, but a grave and quiet manner about them which impressed me strongly, and inspired me with more respect for them than I had entertained previously. As soon as the meal was ended, the men lighted their pipes, and employed themselves in cleaning and examining their guns and bayonets; some conversing on the approaching conflict, and others occupied in thought, probably of relatives and friends at home whom they might never see again. As for the Spahis, they behaved themselves much as usual. They were not likely to have any share in the fighting, unless the Kabyles were driven into the plain, and there was little likelihood of their getting any spoil in the affair, which, perhaps, might account for the rather discontented expression of their dark faces.

In the course of the evening I rode with Hamed round a mountain to the east of that occupied by the Arabs, and we ascended it by a long and rather steep path, which eventually brought us out on a plateau, from which we had a full view of the Kabyles opposite, who were certainly not more than three hundred yards distant, and from whom we were only separated by a very deep ravine. It at once occurred to me that if there were no danger of a surprise by the natives, I might watch the whole action from this spot, and possibly get some pictures. I asked Hamed if there was any danger of the Arabs attacking me here; but he assured me that there was not the least, as every man they could muster would be engaged in the contest. I did not like the idea of being up here alone, but the thought of my friends in England, and possibly the desire of making some sensation among photographers by the display of photographs which might be said to have been taken on the field of battle, had something to do with my decision; but I did not stop then to analyse motives, but came to the determination that I would make the attempt. It was nearly ten o'clock when we returned to the camp, and it was requisite that I should start before sunrise, consequently I had to bestir myself to get things ready. I was so anxious, that I woke very soon after midnight, and though my enthusiasm was not so warm as on the preceding evening, yet I would not admit a thought of drawing back; and as soon as I had called up the Arab who was to accompany me, and had warmed some coffee over a spirit lamp, I helped to pack the *matériel* on the back of a horse, and within an hour I was on my way, followed by the native leading the horse. I felt extremely cold, but the air was quite still; had it been otherwise, and at all boisterous, I believe I should have availed myself of this excuse to have returned to camp. I was obliged, too, to ride slowly, for fear we might miss our way, and this added another item to my discouragement. It is one of the greatest bores imaginable to be compelled to proceed at a restrained pace in the dark, when you cannot tell any instant but some individual may spring upon you who would like to cut your throat for the mere honour and glory of the thing; and though it was twilight on the plain, it was almost dark as I rode along between the trees which thickly covered the lower part of the mountain. Happily, once entered on the path, there was no danger of missing my way, and after a ride, which seemed ten times as long as it did on the previous evening, I found myself on the same plateau. In order to operate successfully, it was necessary that I should place my camera in advance of the tall shrubs which were growing all over the plateau; on the other hand, if I did so, there was almost a certainty of my being noticed by the enemy, who might possibly imagine that I had got some new instrument with which I was about to do them some damage, and therefore send a party to anticipate me by putting a bullet into me, or by some other violent and sanguinary measure. After a little thought, I adopted means for concealing my proceedings similar to those employed by the Thanes in their attack on Macbeth's castle: I cut some bushes, and sharpened the points so that they might run easily into the ground, and then planting my camera so that it should command the side of the mountain opposite, I arranged the bushes so as to conceal it until I should find it necessary to commence operations. By this time the sun had risen sufficiently high to enable me to distinguish our camp in the plain, but there was as yet no sign of movement. I therefore went to the edge of the wood to see whereabouts and in what manner the Arab had provided for the two horses. I found them hobbled, and, as an additional precaution against their wandering, fastened to a couple of saplings by long ropes. The Arab had gone to the camp to his master; and though he would have been of no use to me had he stayed, I wished him back. To wile away the time, I lay down and ate a biscuit I had brought with me, and when that was finished I lighted a cigar and crawled to the edge of the ravine, from whence, screened by a shrub, I could see both the camp and the enemy. Soon I perceived the only two guns we had with us brought to the foot of the mountain, and the Zouaves assembling in order, waiting the signal to charge. Then came a puff of smoke from one of the guns, and almost simultaneously with the sound reaching me I saw splinters of rock flying about on the mountain opposite. I was rather surprised that all this time the

enemy had shown no signs of their presence, and I began to fancy they had stolen away during the night; but a second shower of grape, directed among some bushes lower down, showed that they had been stung into existence, and they at once began an irregular fusilade, which, though they are excellent marksmen, was too distant to do us any harm. A few more reports, and the enemy swarmed from behind rocks and bushes, and added by their shouts and firing to the uproar which filled the air. This appeared to me a good opportunity of getting a picture, before the atmosphere became too much obscured by smoke; and I accordingly shut myself in my tent, prepared and inserted the plate, which I exposed for perhaps half a second longer than I should have done under other circumstances. To make sure of the picture, I developed and washed it at once, and placed it against the edge of the tent to dry. These operations were not performed without some trepidation on my part, as you may well imagine, seeing that the firing of guns and the shouts and cries of the Arabs were ringing in my ears the whole time. When I had again reached my former post I found the Arabs had descended lower down the mountain; but when they found that, in proportion as they were massed together, the bullets from the French guns killed and wounded more of them, they dispersed themselves behind the pieces of rock and the bushes. There was now a movement among the Zouaves. They moved at an ordinary pace until they had fairly commenced the ascent of the mountain; then they dashed upward with an unwavering purpose, which was so manifest in their advance, that I should not have been surprised if the Arabs had fled at once, although they enormously exceeded the French soldiers in number. Upwards and onwards, with the steady determination of the youth of whom Longfellow says "Excelsior," came the white-gaitered, white-turbaned, swarthy soldiers. They did not fire a shot, though bullets were flying thickly about them, but came on with the bayonet, resistless as fate. The Kabyles, who, as marksmen, might compare with any troops in the world, and who are naturally as brave, could not withstand the contact of the gleaming steel; they fell back as the Zouaves pressed upon them, though some of them kept up a continual fire from under cover. I chose this moment to take a second picture, and from this time until the termination of the firing I renewed the plates, until I had exhausted the supply I had brought with me. Fortunately, as I thought, the battle was by this time at an end, and the French soldiers had possession of the heights, though parties of them were still engaged in driving off isolated bodies of Kabyles. The outposts were placed, and soon fires were lighted; and the wounded, of whom there seemed to be very few, were conveyed down to the camp; while those who had escaped sat down to a meal which they had well earned. By the time I had arranged my negatives in the box, and put the utensils I had made use of into their proper places, I found that the sun was setting, and I began to feel anxious for the return of the Arab who was to lead the horse carrying the camera and other things down to the camp. It suddenly occurred to me that I would go and see after the horses; but when I got to the spot where they had been tethered they were not to be seen; the ropes by which they had been fastened had likewise disappeared. I was now in a predicament which caused me no little alarm. I could not doubt that the horses had been stolen; the only question in my mind was whether the thief who had taken them had discovered my presence on the plateau or not.*

THE LADIES OF JAPAN IN THE STEREOSCOPE.

A GENTLEMAN, who returned not long since from Japan, called upon us a few days since for the purpose of showing us some sketches of Japan and its people, which he had mounted for the stereoscope according to the manner described by us in the article on Mr. Sang's invention. One of the sketches gave an exceedingly pretty view of Nagasaki, but the more interesting pictures were those of groups of females. Their faces are very attractive, from the expression of gentleness which is their chief characteristic. We are sorry, however, to have to destroy the pleasing illusion which exists as to their innocence. If we judge them by our standard, they are among the most immoral on the face of the earth. The gentleman referred to assures us that the women who bring you your tea in the public gardens—which abound—are, without any exception whatever, women of loose character. At Nipon it is difficult even to guess at their number, so numerous are they. This class of women are not looked upon in Japan with the same contempt as here; on the contrary, they very frequently make good marriages, and are invariably well and kindly treated; and in cases where they have been purchased by the keepers of these houses from their parents when very young, these men, if the girls give promise of beauty, expend considerable sums on their education, and in teaching them various accomplishments.

* The conclusion of this letter will be published next week.

Photographic Chemistry.

NATURE OF THE METALS.

(*Continued.*)

Aluminum is a metal remarkable for its extreme lightness, and its relative unalterability. It may be obtained by causing sodium to act on its chloride of aluminum when heated to a red heat; either in the air or oxygen it burns brilliantly, absorbs oxygen, and forms the oxide known as alumina, which is a compound of 2 equivalents of aluminum with 3 of oxygen. Alumina is a fine light powder which absorbs water, but does not dissolve in it, and, in this condition, can be moulded into any shape; and when subjected to the action of heat, diminishes in size, and becomes exceedingly hard. It has been imagined that this substance furnished an exception to the rule that solids expand under the influence of heat. Aluminum combines also with chlorine, selenium, sulphur, and phosphorus.

Glucinum is the metallic base of the earth glucina. It can be obtained from the earth by causing potassium to act upon it. It is a very scarce metal. Combined with oxygen it forms glucina, one of the constituents of the emerald. It combines with chlorine, selenium, sulphur, iodine, bromine, and phosphorus.

Barium is a metal which can only be obtained by a very complicated process. It is of a gray colour. It oxidises on being exposed to the air; and a protoxide is formed known as baryta, which, if heated in oxygen, absorbs an additional quantity of that gas, and forms the peroxide. Barium exists in nature in the common mineral sulphate of barytes, from which mineral baryta is obtained by a process it is not necessary for us to describe. Barium also combines with sulphur, phosphorus, chlorine, and bromine. It should be borne in mind that all the compounds in which barium enters are very poisonous.

Strontium is a metal strongly resembling barium in its properties; it is seldom seen, except in combination with oxygen, when it forms the earth strontia, from which it can only be disengaged by a very complicated process. Strontia is the protoxide of strontium, and there is also a peroxide, which may be obtained by heating the protoxide in oxygen. The latter oxide is obtained from the sulphate of strontia. At present the compounds of strontium are of less use to photographic than to pyrotechnical chemists; the latter availing themselves of a quality possessed by some of them, of colouring flame a brilliant red, in the manufacture of what, in theatrical parlance, is termed red fire.

Uranium is a metal which recent events have forced on the attention of photographers, the qualities of which are much disputed. It is obtained from the mineral pitchblende. The manner in which the salt of uranium, employed in

photography, is obtained, is by pulverising the pitchblende, and then attacking it with nitric acid, which dissolves it with great facility. The solution is evaporated to dryness; then water is added for the purpose of dissolving the nitrate of uranium, and any foreign salts that may be present. The liquid is concentrated, and a deposit of yellow crystals, with a greenish reflection, takes place; these crystals are nitrate of uranium. To purify them, they are re-dissolved in water, which is again evaporated, until the liquid is sufficiently concentrated to deposit the crystals. These crystals are now sufficiently pure for use; but if extreme purity—and such purity is desirable, if not essential, in all substances employed in photography—be desired, the crystals may be again dissolved in ether, and re-crystallised. Uranium is obtained from the chloride by a precisely similar process to that employed for obtaining several other metals which have been described, viz., by the agency of potassium.

Cadmium, in certain of its compounds, is somewhat extensively employed in photographic operations. The iodide and bromide are used in the preparation of iodised or bromised collodion—the object of their employment being to give more stability. Thin sheet cadmium may be employed for making the iodide in the collodion itself, by placing a sufficient quantity of it in the collodion and then adding iodine; the two substances react on each other, and the iodide is formed, which remains in solution. The decoloration of the liquid indicates when the operation is completed.

Dictionary of Photography.

ACHROMATISM.—The production of the achromatic lens is the result of one of the most beautiful and ingenious expedients in the science of optics; and, at the same time, it is not at all difficult for moderately scientific readers to understand.

When a ray of sunlight is allowed to fall on a prism, or the edge of a lens, it will be decomposed into its constituent colours, and the result will be the beautiful band of colours, known under the name of the solar spectrum. The reason of this is, that each separate colour is bent or *refracted* out of its course in a different degree. Red being the least refrangible, will deviate the least from the original course of the ray, whilst the violet, being the most refrangible, will fall below the red ray, and the other rays being of intermediate refrangibilities, will fill up the intervening space, lying side by side, and the whole forming the spectrum as shown at page 31.

It was at first thought that all kinds of glass, when made into prisms or lenses, if they possessed the same mean refractive power, would also produce spectra of the same length from the red to violet, or, in other words, would have equal dispersive powers; and hence that achromatism, or the destruction of colour, could only be effected by opposite and equal refractions; and, as in this case, the beam, after being refracted and dispersed by one lens, would be affected to just

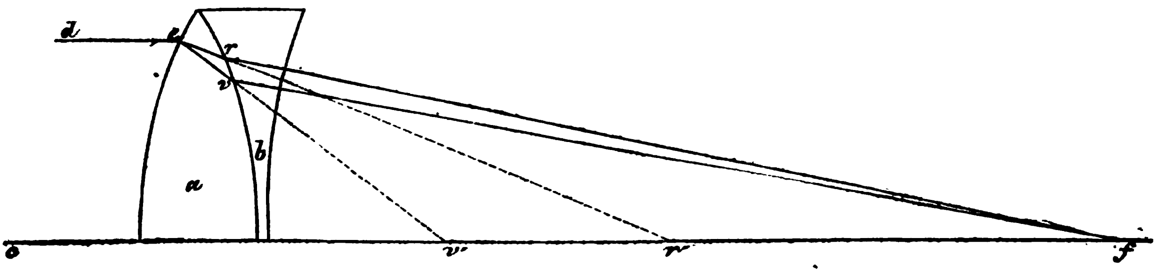


DIAGRAM SHOWING THE COURSE OF A RAY OF SUNLIGHT THROUGH AN ACHROMATIC LENS.

Manganese has not as yet been applied to photographic operations, but is exceedingly useful for various purposes. It is used by glass-makers to give a purple colour to glass, and also for rendering glass colourless. These opposite effects depend on the strength of the oxide—manganese combining with oxygen in four proportions. If glass be rendered green by the presence of protoxide of iron, a small quantity of binoxide of manganese added will discharge the colour, and make the glass colourless; this effect is accomplished by a portion of the oxygen in the binoxide of manganese being attracted to the iron—the latter becomes a peroxide, and loses its colouring property; while the binoxide of manganese which is capable of giving a purple colour to glass, is reduced to the condition of a protoxide, which has not that power. This metal is obtained from the black oxide of manganese, which is, in fact, the binoxide, and as such is commonly found in nature. This oxide is largely used by chemists for the purpose of procuring oxygen, and also for liberating chlorine from hydrochloric acid and sea salt, iodine from iodide of potassium, &c.

Chromium is a metal which, as such, is not at present used in photography, though it is of great use in the arts; to its presence, in combination with oxygen, various pigments are indebted for their colour. The bi-chromate of potash is of great importance in most systems of heliographic printing, in which it is employed mixed with some organic matter. Recent discoveries, especially Mr. Talbot's new discovery of Photoglyphy, show it to be a substance of primary importance in such operations.

(*To be continued.*)

the same degree in the opposite direction by the other lens, it was evident that the ray would emerge parallel to its first direction, and thus the object of the lens, viz., *convergence* of rays, would be lost. Further experiments, however, proved that this conclusion was erroneous, and it was found that *flint* and *crown* glass, whilst their mean refraction is different, disperse equally, or produce spectra of the same length. Our present achromatic lenses are consequently made of these two kinds of glass.

Let *a* be the section of half a convex lens of crown glass, and *b* of a concave lens of flint glass, *c f* their common axis. If *d e*, a ray of sunlight, fall upon the external surface of the crown glass *a*, the red or least refrangible ray will take the direction *e r*, and the violet the direction *e v*; and if these rays were not intercepted, they would proceed to the axis, and there form coloured images at *r' v'*. The concave lens, however, now causes a divergence of these rays to take place, and the ray *e v* being, as before, more refrangible than the ray *e r*, they gradually approach each other, and are reunited at *f* the focus, where a nearly colourless image will be formed. The reason why the image is not quite colourless, is on account of what has been termed the irrationality of the spectra of the two kinds of glass, that is, the several colours have not an exact proportion one to another, and, consequently, they cannot be perfectly reunited by the second lens after having been separated by the first.

The terms *over* and *under*-corrected are explained as follows:—If the lens *b* in the diagram is not sufficiently curved to effect the reunion of the two coloured rays *r f* and

v f, the lens is under-corrected; if, however, it do more than is required of it, the lens is said to be over-corrected.

Acids and Alkalies.—*Acids* are, as a general rule, distinguished by their solubility in water, peculiar sour taste, and the property which they possess of turning vegetable blues red. Tincture of litmus, for instance, is of a blue colour, which is easily changed to red by a very small quantity of acid; and this property is made use of by photographers and chemists, who employ paper which has been stained with this tincture, as a test for the presence of acid in a solution.

Alkalies are distinguished by many properties exactly opposite to those characterising acids. They are soluble in water, and have a burning, disagreeable taste. They restore the colour to some vegetable infusions which have been reddened by acids, and others they turn green, as in the case of infusion of red cabbage, and syrup of violets. They also turn several vegetable yellows brown, as turmeric and rhubarb. Litmus paper which has been dipped in a very dilute acid, so as just to give it a red tinge, is an extremely delicate test for showing the presence of an alkali, as the slightest trace of this latter body restores the blue colour. *Turmeric* paper which is changed from yellow to brown by alkalies, is sometimes used for this purpose; but it is not so delicate a test for the presence of an alkali as red litmus paper.

Acetic, nitric, and tartaric acids are common instances of the class of acids, and potassa, soda, and ammonia, of the class of alkalies. Each class is remarkable for its energetic chemical action.

(*To be continued.*)

A Catechism of Photography.

VII.—VARIOUS PROCESSES.

Q. Are all photographic operations conducted on the same plan?

A. No. All photographic processes have, in common, the object of producing an extremely thin surface-layer or film of iodide of silver, for the reception of the image which is to form the picture; but they differ in the modes by which this is effected, and in the substances used to support the surface-layer.

Q. Do all photographic processes depend upon the action of light?

A. All photographic effects are the result of the chemical action of light on prepared surfaces, and, in the pictures so procured, the lights and shadows are reversed from what they are in nature. The whites are black, the blacks are white; the darkest shadows are the brightest lights, and the brightest lights the darkest shadows. A photographic picture of this description is called a *negative*. An impression taken from such a negative, in which the natural effects of light and shadow are restored, is called a *positive*.

Q. Are all photographic pictures, taken in the camera, negative?

A. Not all; in the daguerreotype the *positive* picture is taken at once, and the same thing has sometimes been done with the collodion.

Q. Are the various processes of photography very numerous?

A. They are; but they may naturally be divided into four principal sections, namely, paper process, the collodion process, the albumen process, and the daguerreotype.

Q. Does not each of these divisions contain many varieties of process?

A. Each division contains many varieties of process, but all agree in the same leading features. To indicate every process would involve endless and useless trouble, and could only perplex and discourage the young photographer. It is best to look at each in its most simple form, and as it is generally employed, without detailing the various modifications which almost every photographer introduces for himself.

Q. Which is the best process of photography?

A. Each has its advantages and disadvantages, its claims and its drawbacks; each is very excellent in its way; and it must be left to the taste and judgment of the operator to select that process which he finds most convenient to him.

Q. What opinion is generally entertained as to their respective merits?

A. The collodion process is considered the best for taking portraits, on account of its rapidity of action. The paper process is admirably suited to the travelling artist, who is desirous of securing exquisite souvenirs of his wanderings. The albumen, again, has its advantages; and the daguerreotype is not without its warm and devoted advocates. In the daguerreotype we have extreme microscopic minuteness; in the collodion, the highest degree of sensitiveness; the albumen rivals the daguerreotype in sharpness of definition; while the paper processes combine many of these good qualities, and possess advantages which cannot be overlooked.

VIII.—CALOTYPE.

Q. What is meant by photography on paper?

A. Under the name of photography on paper we place the different processes by means of which we immediately obtain a negative photograph on prepared paper.

Q. Are the principles of photography on paper the same as those of the collodion and albumen?

A. The principles of photography on paper *are* the same as those of the collodion and albumen—namely, the obtaining of a surface coating of iodide of silver, on which to receive and develop an image; but the mode of preparation is different. It would be tedious and useless to detail all the various plans, with all their modifications, which have been proposed. It is best for the young photographer to confine his attention to those most generally employed.

Q. Who was the first discoverer of a photographic process on paper?

A. Mr. Fox Talbot.

Q. What did he discover?

A. That paper, the surface of which had been previously prepared, received a photographic image when placed in the camera. This he called the calotype, but, in compliment to the discoverer, the term Talbotype is now more generally employed.

Q. When did Mr. Talbot's discovery first become known?

A. Early in 1830 the results of Mr. Talbot's process became known, and specimens were handed about in the scientific circles of London and Paris. Mr. Talbot protected his discovery by a patent, but with his characteristic generosity he has since made a free gift to the country of the result of his valuable experiments.

(*To be continued.*)

Correspondence.

FOTHERGILL'S PROCESS.

Sir,—In my notes on Fothergill's Process, sent last week, I omitted to mention that the "developer" requires the addition of 10 drops of a 25 grain solution of nitrate of silver to the ounce. You will doubtless find in the various communications elicited by your request for information on this subject, the same discrepancy which pervades almost all the published accounts of its manipulation. To those who have no inclination to examine into its *rationale*, the difference of opinion as to the amount of washing absolutely required on the withdrawal of the plates from the nitrate bath will be very perplexing. In Mr. Fothergill's letter in the *Times* of April 24, the directions are simply "to wash the plate with rain water, and after draining for about half a minute, to pour on the collodion film dilute albumen" (one egg and a quarter of an ounce of water). He does not recommend the use

of "liquor ammoniæ," but I have ascertained by frequent experiments, that this does no harm to the plate, but aids materially in clarifying the solution, which, without it, is slightly opalescent. Some of my friends have failed altogether with this process, simply in consequence of their supposition, not perhaps unnatural, that the object of the first washing was to remove all the free nitrate from the sensitised film; and it is probable that the very indefinite directions on this *most important point*, in the letter alluded to, have made many despair altogether of deriving any advantage from this most opportune discovery. Had it not been for the valuable information I derived from Mr. Keene, of Leamington, before the publication of Mr. Fothergill's communication, I should probably have fallen into the same error. The chief points to be borne in mind seem to be, that the washing of the film is simply to remove the nitrate solution attached to its surface, and that on no account must any attempt be made to displace that portion which has penetrated the molecules of the collodion. Pouring the water upon the plate with any force, or violently moving it on the surface in the washing bath, will certainly be fatal to success. The combination of the albumen with the imprisoned nitrate, and the formation probably of albuminate of silver, or, at all events, of an extremely thin film insoluble in water, seem to constitute the essence of sensitiveness, and preservation from change, either by atmospheric influence, or chemical decomposition.

Now for one word in conclusion on the "vexed question" of the *amount of washing* required. All are, I presume, agreed on one point, that sensitiveness is depressed in the same ratio as the quantity of water employed for this purpose is increased. I began with half an ounce, poured very gently on one corner of the plate (stereo. size) placed on a levelling stand, and tilted gently, so as to produce a wave-like motion for about half a minute, by which time all greasiness had disappeared from the surface. Plates so prepared are very sensitive, and although my bath is slightly acid, I have constantly taken stereoscopic pictures in the shade, out of doors, in twelve seconds—a specimen of which, badly printed on damaged paper, I inclose herewith. But I found that I could not place such dependence on the keeping qualities of these plates as was desirable. They occasionally exhibited, at the corner on which they rested to dry, the appearance indicated in the specimen negative which I also inclose, which, though not absolutely fatal to the picture when printed on paper, would prove somewhat damaging to a transparent positive. This has induced me to sacrifice sensitiveness to certainty; but when I wish to employ dry plates for portraiture, for which this process is exceedingly well calculated, I invariably use the smaller proportion of water. In the admirable pamphlet published by Mr. Ackland, vol. i. p. 17, I was astonished to find that he recommended for the first washing *six ounces of water*, and, suspecting that this was a misprint for *six drachms*, I wrote to Mr. Ackland to ascertain the fact, and received from him the following reply:—"I find that the quantity of water stated (6 ounces) is not too great for our collodion, but as every reader does not purchase from us I have substituted the additional directions inclosed, which appear suitable for all samples." (These have appeared at p. 17 of the "Photographic News," vol. i.) Mr. Ackland then continues, "You will observe the plate must be very gently washed, then placed in a definite solution of nitrate, and then drained 50 to 60 seconds before pouring on the albumen; this latter is important with some samples, to gain intensity. My success with this plan is constant, and others who practise it are succeeding also. The bath may be neutral, alkaline, or *slightly acid*. I am inclined to believe that in these plates we have no free nitrate left, all is decomposed, as they *keep without a* stain for two months, and appear as though no change had taken place. Three or four of my correspondents have complained of stains spreading upwards from one corner to about one third of the plate, but as I cannot produce such stains, I cannot explain them."

The plate which I inclose (the negative of my house) was exposed about a minute, after having been sensitised a fortnight, and the stain which it exhibits was distinctly perceptible before exposure (lens 4½ inches focus). It is a fact worth knowing, that the behaviour of a plate during development is indicated almost to a certainty by its appearance previous to exposure. Stains are always to be suspected when the tint of the iodide of silver is not uniform; the slightest darkening of the yellow is the sure precursor of a stain.

Nov. 1st, 1858. W. L.

[The negative with which we have been favoured is one of the most perfect we ever saw, both in respect to half-tone and vigour.—Ed.]

EMPLOYMENT OF LEAD IN PHOTOGRAPHY—NOTES ON THE STEREOMONOSCOPE.

Sir,—As the problem of printing photographs with a "printers' ink" blackness is at present *the* question with photographers, I beg to communicate a small fact which I have observed in my experience.

After sensitising some paper, I affixed it by a pin to a wainscot, painted stone-colour; and where the silver solution, in dropping down it, had accumulated, I found, after light had been admitted sufficiently, a black spot, resembling the bloom on a negative, very much the colour of printing ink, but with a brownish tinge. Concluding it was the lead in the paint that caused it, I made some experiments with acetate of lead; but as my knowledge of chemistry is very slight, you will not be surprised at learning I did not succeed as I had hoped. Not having heard of lead being used for darkening positives, I thought a recital of the bare facts might be of some little value.

I have been much interested in reading M. Claudet's paper on the Stereomonoscope—the more especially as it is the realisation of an idea which occurred to me nearly two years ago. I add an extract from a letter I then wrote to a contemporary:—"Shortly after being attracted by the charms of our beautiful, but somewhat fickle mistress, it struck me that the transparent stereoscopic views would form excellent slides for the magic lantern. Following up this idea, it occurred to me that if two lanterns were employed as in dissolving views, and the two views thrown to one point, the stereoscopic effect would be produced."

You will thus perceive that, so far, M. Claudet and myself agree in principle, although we differ in application. But here I stopped;—for after my communication was in print, I saw, while studying a slide, with this idea in my mind, in a moment—what I must have been very stupid not to have observed before—that the perspectives of the two views would occupy different positions on the medium to be employed for receiving the rays, and thus cause great confusion; and not having the necessary apparatus by me to prove myself wrong, I at once gave up all further thought about it.

In writing this, I do not wish to claim the least share in M. Claudet's discovery or his application of it, as, but for the peculiar properties which he has found ground glass to possess, the attempt to carry out my original idea would be like playing the tragedy of *Hamlet* with the part of Hamlet omitted. My object is to obtain his opinion as to the feasibility of employing the magic lantern in the manner I have described, and throwing the image on to a large plate of ground glass, so as to enable an audience to enjoy, all at once, the delightful illusions of the stereoscope,—the goal I had in view when I first speculated on the matter. Apologising for the length of this note, I am, Sir, yours very obediently, Alfred Molson.

STEREOGRAMS FROM FLAT SURFACES.

Sir,—I have had much pleasure in reading your very fair criticism of the stereographs of "The Bottle," and your amusing plan for making them. There is only a single thing I could have wished to have been different in your

paper, and that is, the absence of any remark that the stereograms were put forth as merely an attempt, which you will observe they bear to be on their title. I would not have ventured to notice this, only that I have now the pleasure of sending you a much better card of the same nature, "The Sultan and the Commanders of the Allied Armies." The cards of "The Bottle" were done with imperfect, but gradually-improving apparatus, so that they are unequal in quality, and plenty of faults can be detected in those of them first tried, especially if they are examined with a microscope. The process of stereographing them is very difficult. At first sight you may perhaps imagine that the heads of the figures on this card are, as you have described, flat, and as if they had been cut out of paper; but on a more attentive examination, you will find that in reality they, as well as all the other parts of the picture, are solid and round. The thinness apparent at first sight is owing to the heads in the engraving being little more than outlines. A slight defect in the position of the hind legs of Napoleon's horse, which you will perhaps detect on minute examination, is due partly to the drawing, and partly to the side motion between the picture having been purposely exaggerated in order to make the rounding of the figures more apparent. The exaggeration, however, is no more than is allowable, or at all events is less than that in nine out of ten of the stereoscopic views taken from the round. JOHN SANG.

Kirkaldy, 8*th Nov.*, 1858.

VIEWS FOR PHOTOGRAPHERS NEAR LONDON.

DEAR SIR,—D. E., or other subscribers to the "PHOTOGRAPHIC NEWS" who wish to take views near London, would do well to visit Woodford, where beautiful photographs might be obtained. The village of Chigwell, three miles from Woodford, has also some very pretty scenery. Woodford is about ten miles from London, and may be easily reached by the Eastern Counties Railway, either from the terminus at Fenchurch-street or from Shoreditch.

F. W. B.

Photographic Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.—ANNUAL GENERAL MEETING, 3*rd November*, 1858.—MR. LUND, in the chair.

The CHAIRMAN stated that Mr. Cottam, the late hon. sec., having been obliged to resign his secretaryship from ill-health, Mr. Mann had been appointed the hon. sec. of the Society.

After the election of the officers of the Society for the ensuing year, it was unanimously resolved that a vote of thanks be returned to Mr. Cottam for his past services as secretary.

In consequence of the absence of both the treasurer and late secretary, from ill-health, the annual report was not prepared for the Society, but would be ready by the next meeting; it was stated that there was a small surplus now in the hands of the treasurer. Three new members were ballotted for and elected. Some very beautiful landscape and sea views, with clouds, by Mr. Kibble, of Glasgow, were exhibited to the members and much admired; also four beautiful prints from collodio-albumen negatives were presented, by Mr. Sidebotham, to the Society's portfolio.

A few prints taken by Mr. McCraw's bichromate printing process by a member, were shown, but considered very unsatisfactory, some being half positive and negative, and some quite negative, and otherwise imperfect.

A letter was read by the secretary from the Liverpool Photographic Society to the members, inviting them to a conversazione at Liverpool on the 18th instant, when Mr. Shadbolt has promised to read a paper. The secretary also read the following report of the Committee appointed to experiment on the various dry processes on glass:—

"The Committee appointed in November, 1857, to examine the published dry processes on glass, present the following report:

"Each of the processes has one or more good qualities not possessed by the others, and by all of them good pictures may be produced; but it is only when the various processes are carefully tried by the same individuals that a true comparison can be made.

"After very careful experiments your committee have arrived at the conclusion, that the best dry process yet discovered for landscape photography is the Taupenot, or collodio-albumen process. Its superiority consists in its rapidity and certainty, and also in the beauty of its results; the fact that, since this committee was formed, the members who previously had successfully practised the albumen, the oxymel, and the dry collodion processes, have abandoned them for the collodio-albumen, greatly favours this conclusion.

"Your committee briefly state what they consider the points in which the other processes are inferior.

"*Albumen Process.*—The long exposure and development required, and the difficulty in the preparation of the plates, so as to produce an even film, perfectly free from spots.

"*Dry or Baked Collodion.*—The difficulty of procuring a collodion of suitable character; also, that the plates do not bear long keeping, nor prolonged development.

"*Oxymel.*—The long exposure required, and the difficulty of carrying a stock of sensitive plates, and keeping them free from dust. The modification of this process, lately published by Mr. Llewellyn, appears very promising, being founded on the correct principle of leaving a definite amount of free nitrate of silver on the plate; but your Committee are not prepared to report finally upon it, although several members have tried it, and speak very favourably of its results.

"*Gelatine Process* (Dr. Hill Norris's, and others).—The time of exposure required is considered to be at least double that of the collodio-albumen; your committee have tried great numbers of plates, prepared both by themselves and Dr. Hill Norris, taking the same views upon them, and on collodio-albumen plates, and their experience, in every case, shows that a *very much longer* exposure is required than that usually recommended.

"In common with all dry processes, there is often a deposit formed on the plate during the development; this, in collodio-albumen, can be entirely removed, but in gelatine it cannot, without destroying the picture. Since this committee was formed, Mr. Fothergill has published his process, which promised much from its simplicity; it has been carefully tried by some of the members of this committee, and by them considered not equal to the collodio-albumen process, in the long exposure required, and, also, in the negatives obtained being of inferior quality, also, any deposit formed on the plate cannot be removed.

"Your committee will now briefly state what they consider a few of the advantages possessed by the collodio-albumen process:—

"Any good collodion, whether positive or negative, will do for this process.

"The albumen, being prepared with ammonia, will keep almost any length of time.

"The exposure required is moderate; pictures may be taken with an exposure of 15 seconds and upwards, according to the focus of the lens, subject, &c. The exact amount of exposure is not a matter of such great importance as in some processes. A negative either over or under-exposed a little, may generally be so treated in the development as to come out quite perfect, whilst any deposit which may be formed on the surface can be easily removed by the finger without injury.

"The great drawback to this process, viz., the liability of the plates to blister, may be entirely avoided by adopting the following precaution:—

"Have the plate thoroughly dry before coating with collodion; leave the film to set well before immersion in the bath; and, after coating with albumen, and the plate well drained, dry it quickly with the face to the fire.

"During the investigation of the various processes, your committee have been strongly impressed with the difficulty under which photographers labour, in the multiplicity of the published processes, each of which is said to surpass all others. Many photographers, working almost alone, are inclined to think too well of their own productions, and, consequently, of the process they use; and your committee think it would be a great benefit to the members of this Society, if specimens were to be procured from well-known operators, or inventors of new

processes, showing, as far as possible, of what each process is capable, and, also, serving as standards by which to judge their own productions."

A vote of thanks was then unanimously passed to those gentlemen who experimented upon the various processes and prepared the report. A general discussion as to the collodio-albumen process took place, particularly as to the blistering of the film.

Mr. Broughton stated that he had very successfully removed the red colour of collodio-albumen plates occasioned by long keeping, and took with him a reddened plate, belonging to a member, which he promised to bring to the next meeting free from the red colour. He stated the plan he adopted was, to use a very weak solution of bichloride of mercury.

Mr. Parry explained his contrivance for drying collodio-albumen plates after the albumen coating, consisting of a gas-light under very fine wire gauze.

It was proposed and agreed that a lantern should be obtained by the next meeting, and that members be invited to bring transparencies for exhibition. And after passing a vote of thanks to the Chairman for his services, the proceedings closed.

Miscellaneous.

The Present Position of Photography.—The following able remarks on photographic matters appeared recently in the pages of our contemporary, the *Literary Gazette*. Our object in transferring them to these columns is to give them a circulation among those whom they are likely to interest; and, moreover, we think that they deserve to be well known and read. After noticing the service which photography has rendered to the world, it says that—" At first it seemed likely to be confined to making black and blotchy libels on the scenery of nature, or sullen caricatures of humanity. Now not only has it, as every one has seen, attained the power of preserving, in nearly all their strength and grace, manly intellect and feminine loveliness, but it has come to be regarded as an invaluable adjunct to the man of science, the artist, and the antiquary. By the astronomer and the meteorologist photography is employed to keep a sleepless record of the observations made by the exquisite automatic instruments now constantly at work for so many important purposes. By it the phases of the moon, the aspects of the sun, the culminations of the planets, are depicted with a delicacy and precision previously supposed unattainable. The anatomist has availed himself of it in cases where the pencil would have been of very inferior service. Professor Owen can tell of what singular aid it has been found in certain palæontological and geological inquiries. The archæologist, the philologist, and the historical investigator are discovering in the fac-similes of rare manuscripts, documents, and inscriptions, which only photography can yield, that a new instrument of great power has been furnished them. While artists and lovers of art now find in it not a substitute for thought, imagination, and observation, but an assistant by whose help they may be better enabled to grapple with the increased requirements of their calling, and perhaps to create in the coming years that new style which the exigencies of the coming years may demand. Much doubtless remains to be done by and for photography; but the astonishing progress which it has made during the brief time it has been in existence justifies the anticipation that neither the art nor its professors will be found wanting. Already, by the Instantaneous Process, a clear and unimpeachable picture may be obtained of the most evanescent phenomena. And when a true copy can be taken of a printed page rotating on a wheel in rapid motion, and only illumined by a lightning flash; the representation be effected of a bomb-shell in its flight through the air; a scene be caught from the deck of a steamer in swift progress; the precise curve and curl and light and shadow of a falling wave be fixed upon paper—all of which remarkable feats have been accomplished—what can be regarded as unattainable when the process is still further improved, and the vehicles are rendered still more sensitive and permanent? Or what may not be anticipated from other as yet undiscovered processes, or the improvement of those already known, in a pursuit which is engaging the attention of so many men of the highest professional and scientific attainments, and the acutest intelligence, in every part of the civilised world?"

Photographic Notes and Queries.

SEDIMENT IN DEVELOPING COLLODIO-ALBUMEN PLATES.

Sir,—Owing to the expense of distilled water, I have been lately using common rain-water in the collodio-albumen process, and on developing I have frequently been annoyed by a sediment forming on the plates during development, and thus giving rise to spots and stains. Can you suggest any remedy for this inconvenience? Δ

Torquay.

[The sediment complained of by our correspondent no doubt arises partly from the use of impure rain water. This, except caught in the country and in the neighbourhoods free from smoke or atmospheric impurities, is frequently very much contaminated with organic matter; also, after a continuance of dry weather, considerable quantities of free ammonia may be present in the first rain that falls, and this would be fatal to most photographic operations. Our correspondent must have over-estimated the expense attending the employment of distilled water in the collodio-albumen process. It can be procured of any respectable druggist for about sixpence per gallon, and as it need not be used for all the different operations, but merely for the *last* washings, and in the preparation of the various solutions, the expense for each plate would be too small to be estimated. However, it frequently happens that when pure distilled water has been used for all the operations, the gallo-nitrate turns brown, or deposits a sediment long before its developing properties are exhausted, and therefore it is better to employ some method of operating by which this evil may not injure the picture when it does occur. The best plan is to allow the development to proceed with the plate lying on its face, which can easily be effected by pouring the solution on a perfectly level glass plate or in a flat porcelain dish, and then laying the impressed plate face downwards carefully on to the solution, contact being prevented by placing a slip of glass, piece of silver or platinum wire, or some such innocuous substance, under one corner of the plate. By this means any sediment which may be produced will fall to the bottom, and cannot injure the picture, and the progress of the development can be seen without disturbing the plate by the contrast of the picture against the white porcelain dish, or, if a glass plate be used, by placing a sheet of white paper underneath.]

APPARATUS FOR PRODUCING A GRADUATED BACKGROUND.

Dear Sir,—Having read in the "Photographic News," and other journals, the various methods for producing graduated backgrounds, but not approving any plan I have seen published, I give the following, which I have used some years, and which I think will answer better than taking all the trouble, let alone the waste and constant attention, requisite to produce each single positive. I allude to the plan of taking a positive, cutting out the background, then printing from it; going out again into the light, and shading off those portions to remain light. What, in the name of all that's photographic, do we want to take all this trouble for, when the following simple piece of apparatus will answer all purposes, and do it as it should be done? Those who have plenty of money will construct one of zinc, or other material, and those who are not overburdened will do what I have done, make it of wood or pasteboard. (Really those who follow this art, by way of amusement, had

needs be a jack of all trades.) You will understand this plan directly I tell you it is simply a pendulum, with a star, circle, or oval, about two feet in diameter, of any shape or make—I prefer it circular—fixed at the top of a straight piece of wood heaviest at the bottom; the point of suspension is on the edge of this circle, which may be a piece of stout wire in the head rest, or a properly constructed stand, to raise or lower it to any height required; it must be coloured lighter than the background, a shade or two in the centre, getting darker towards the edge, which should only be a very little lighter than the background; this may be done by striking *a brush, dipped in the colour*, against a stick, thus spotting it—you can take a picture and try the effect. If a star is used it will not require this, but may require a little in the centre to prevent too much light behind the head. A ray of light may also be introduced by having a movable piece to fix behind, extending beyond the background; this must be shaded so as to produce the light strongest at the outside edge, gradually lost in the light behind the figure: this requires the eye of an artist, but I have no doubt that, with moderate ability, many pleasing and artistic effects can be produced. I think you will understand, from the foregoing, that this piece of apparatus is placed at the back of the sitter, in such a position as will give the best effect, and kept in motion, with the aid of a piece of string, during the whole time the picture is being taken. The above is for a moderately dark background; if a light one, it must be coloured dark in the centre, and lighter towards the edges; this will give a shadow behind the figure, lost in the background. B. Hunt.

EMPLOYMENT OF A CAMERA AS A MAGIC LANTERN.

Sir,—In consequence of the general interest taken in magic-lantern representations, I was pleased to see the suggestions in your valuable periodical of October 15th, and accordingly proceeded to put in operation the directions there laid down, by placing a *portrait* lens camera upon a shelf attached to one of the sides of my *dark room*, with a perforation to let the *tube* of the camera through into the sitting room.

Having placed a white screen at a distance from the lens corresponding to the distance occupied by the subject of the negative plate from which the transparency was obtained, I then placed the transparency in a dark slide so as to allow no light to pass, except what passed exclusively through the transparency—the light of a strong moderator lamp, with a *globe on*, at about four inches from the transparency; and, having obtained a proper focus, was disappointed to find that, although there was a very perfect magnified representation of the picture on the screen, it was so *imperfectly illuminated* that it gave nothing more than a badly illuminated scene or view, as if obscured by night.

Will you kindly inform me of the cause of my want of success, and suggest such remedies as will enable me to obtain more successful results. T. H. S.

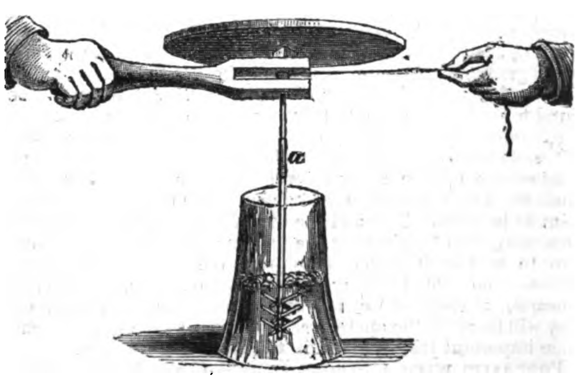
[Insufficient light is the sole cause of our correspondent's want of success. The above plan can only be used when the image is not required to be very large. If more illumination be required the transparency must be removed *pro tem.*, and the lamp having been placed in position put a concave behind it, and a large bull's-eye lens between it and the camera, varying the distances until a bright disc of light is thrown on the screen, then insert the transparency, and proceed to focus.]

MR. McCRAW'S PROCESS.

Sir,—Your correspondent C. B. (vol. i. p. 94) has evidently exposed the papers too long, a very short exposure being required. I have some prints which have turned out positives, and some negatives, when the difference in the time of exposure was only a few minutes; and I have one in which one portion of the print (the foreground) is negative, and the sky, with the trees against it, a decided positive. What I have produced are very poor, dirty-looking prints, and do not offer any encouragement to persevere in the process. J. S.

[Mr. McCraw has favoured us with some specimens of his process. They are very successful both in colour and brilliancy, but have a slight woolliness in the dark parts, and a want of sharpness in the finer details of the picture. These faults may, however, be owing to their having been printed from inferior negatives. Mr. McCraw writes to us: "C. B. has failed from over printing. . . . . . . One new feature in this process is, that these specimens have no glare on the lights where it might be objected to, the albumen only showing on the shadows, giving depth and brilliancy." We should feel obliged if Mr. McCraw would favour us with more minute instructions for obtaining pictures by his process, the information given in our fifth number being insufficient for any but very skilful photographers to follow with any reasonable chance of success.]

APPARATUS FOR FROTHING ALBUMEN.



Dear Sir,—I have used the above apparatus to froth albumen rapidly, and found it answer very well; at *a* can be placed a ferrule, so that the lower part can be taken off. The lower stick is cut into four portions, quills are slid in crosswise, and then tied in position. H. Hurst.

NEUTRALISING THE NITRATE BATH.

Sir,—Allow me to remind "*Perseverance*" (vol. i. p. 82) that he may convert his bath into the same state it was in before using the oxide of silver, by adding nitric acid, which will decompose the acetate, setting free acetic acid.

The oxide is a valuable agent when there is only a limited quantity of acetic acid present, but the insoluble nature of acetate of silver when present to any great extent, bars its employment. Ajax.

ANSWERS TO MINOR QUERIES.

Obtaining Stereoscopic Effect without Moving the Camera.—*Sensitive Sol.* The above effect can easily be obtained without moving the camera if the sliding front which carries the lens is made to move horizontally. The glass plate must be the size of the ordinary stereoscopic slide ($6\frac{3}{4} \times 3\frac{1}{4}$), and the lens must be so arranged that it can come opposite that part of the glass where the centres of the two pictures are intended to be. In this way only a lateral displacement of two or three inches can be obtained. If more be required the lateral range of the sliding front, and the length of the glass plate, must be proportionally increased, or the camera must be moved. (We cannot give the address you want.)

Simplicity of the Talbotype Process.—*H.* asks whether we consider the Talbotype process the simplest to work with, on a tour, without having the inconvenience of dark tent, &c.; and, supposing the tourist to be staying at an hotel, would the process be the most suitable as regards inconveniences of working, difficulties of obtaining water, &c.; also what materials

would be required to be taken from home in order to obtain good pictures with the least amount of trouble. We are decidedly of opinion that the Talbotype is the simplest and easiest of all the paper processes for the tourist. The plan given at vol. i. pp. 38, 51, may be followed, and the preliminary iodising and washing can be performed before starting. The final fixing and subsequent operations may also be left till the return—provided the gallo-nitrate developing solution be well washed off the picture with water, and then the sheet rinsed in a five-grain solution of bromide of potassium. This leaves only the *exciting*, *exposing*, and *developing* to be performed *en route*, and these are operations which may, by the exercise of a little judgment on the part of the operator, be easily managed at an hotel. The materials required are: the camera and its necessary accompaniments; a flat board, exactly the size of the negative paper, not too thick, and pannelled to prevent warping; a glass rod about as long as the diagonal measurement of the negative paper; plenty of blotting paper cut to the size of the negative paper (six sheets of the former to one of the latter); scales and weights; portfolio to contain the iodised paper and negatives, &c.; a gutta percha dish to wash the negatives in; a box containing the following chemicals:—one ounce of nitrate of silver, half an ounce of bromide of potassium, one ounce of glacial acetic acid, half an ounce of gallic acid, and half an ounce of cyanide of potassium, all in stoppered bottles; a four-ounce graduated measure, and empty bottles to hold the aceto-nitrate of silver, and solution of gallic acid. All these will be found to pack up very well together. The sheets can be rendered sensitive at night by candle-light (removed some yards off), and the day's work developed in a short time; and thus no cumbersome opaque and yellow cloths, for stopping up the windows, &c., need be carried about. Cleanliness is the chief point to be attended to, and the cyanide of potassium must be frequently used for cleaning the fingers and glasses, &c., taking care to well wash it off after use. We strongly advise all persons who intend trying this plan to have a few private rehearsals at their own houses before starting, as by this means they will be saved the annoyance of finding, at the last moment, some important trifle omitted in the travelling *matériel*.

Portraits with a Single Lens.—*J. A.* A single achromatic lens will answer for taking portraits if you have good light, and chemicals in perfect order; but, on comparing the results obtained with a single lens, and a double combination of the same focus, the portraits taken by the latter will appear to have more rotundity, and the figures will not seem jammed against the back-ground so much as those taken with the single lens.

Lines on the Collodion Plate in the Direction of the Dipper.—*T. H. U.* These are caused by your having employed a bath in which too much alcohol and ether have accumulated; either add its own bulk of a 30-grain solution of nitrate of silver, or place the bottle containing the bath (with the stopper out) up to its neck in hot water, as recommended at vol. i. p. 106.

Washing Off of the Iodide of Silver in the Bath.—*A Correspondent* had an acid bath, this was neutralised with a saturated solution of carbonate of soda, and filtered; acetic acid was then added, until it just showed an acid reaction, and the result was a bath which produced the above effect. Our correspondent has, doubtless, added so much carbonate of soda, that there is not silver enough left in the bath. Only a few drops of a strong solution of carbonate of soda should be used, as the object is not to precipitate much silver, but only sufficient to carry down with it some of the organic impurities which may be in the bath. As a remedy, add some crystals of nitrate of silver. An over-iodised collodion *might* produce a similar effect; but, in our correspondent's case, we think it is the bath which is in fault.

Fading of Alabastrine Photographs.—Several correspondents having complained of the above, we have been induced to examine the subject more closely, and find that it can be avoided by allowing the mercury solution (vol. i. p. 81) to remain on the plate until the action has fully taken place. If the action be stopped before the full effect be produced, the pictures will be very liable to change.

Injurious Effect of Gutta Percha on the Silver Bath.—*Z.* has purchased a new gutta percha air-tight bath, and finds that it has communicated a fogging tendency to the contained solution. We have remedied this defect by filling our new gutta percha baths with a solution of cyanide of potassium (1 ounce to the pint), allowing it to stand for 24 hours, and then pouring off, rinsing well with water, and, finally, soaking for a few hours in water acidulated with nitric acid.

TO CORRESPONDENTS.

*** *Lessons on Colouring Photographic Pictures will be commenced in an early number. They will include Powder, Water, and Oil Colours, together with a few hints on the Harmony of Colours, and will form a complete and practical treatise on this important branch of the art.*

By accident the signature Θ was omitted from our valued correspondent's article on Positive Printing, at vol. i. p. 86.

J. C. S.—You have not added quite sufficient acid to your bath

C. B.—Your only plan to tell if a lens is really made by the maker whose name is on the brass work will be to apply to him. We know of no private mark.

G. W.—Read the Report of the Experimental Committee of the Manchester Photographic Society, in this number of the "Photographic News."

J. A.—We are much obliged by the information, but the articles on colouring, which we have in contemplation, will render it unnecessary.

Photo. Kent.—The "Photographic News" is always published *punctually* at noon on Friday. There ought to be no delay in obtaining copies of the current number by the next post. *Very many* causes would produce that effect; either an alkaline bath, or insufficient acetic acid in the developing solution, are the most probable reasons for a stainy plate.

E. C.—Glycyrrhizine is not so well adapted for a positive as for a negative bath.

——— Tewkesbury.—See the announcement at the head of this section. Take ordinary muriatic acid, and add bichloride of mercury, in fine powder, to it, in such quantity that no more will dissolve on shaking and standing for some time. We approve of your plan, and wish each subscriber would do likewise.

A. J. C.—Your questions do not admit of a decided answer, so much depends upon the mutual understanding between employer and employed at the time of engagement. You had better advertise in our columns.

A. C. M.—Application to some card maker will be the best plan to adopt.

Waterproof.—We do not think it can be purchased.

C. E.—1. It should have been "60 grains of nitrate of silver, and 4 or 5 drops of acetic acid, to the ounce." 2. Place the diaphragm *in front of* the lenses, and regulate the size of aperture by the appearance of the image on the ground glass. ½ to ⅝ of an inch will be a good size. 3. A twin camera is better than one with a single lens.

C. C.—1. We are sorry we cannot assist you. Your best course will be to advertise. 2. Gutta percha is only very slightly soluble in collodion; put a strip in the bottle, and let it remain for a few days. We do not think it will do much good. 3. The ordinary bath.

Enquirer.—Your lens will do very well to begin with. To find the focal length, fasten a sheet of paper against the wall, opposite a window; hold the lens between the window and paper, and move it to and fro until an image of a distant object is depicted sharply on the paper. The measured distance between the lens and paper gives the focal length, sufficiently near for all practical purposes. Your other questions can only be answered by ocular inspection of a good camera.

G. H.—The fault is not in the fixing solution, but in some of the other chemicals; perhaps the bath is not acid enough, or the collodion not good.

Felix—Inquire at some well-known establishment. We are not in possession of the information.

Z.—One or two small specks in a lens are not of the slightest importance. Prints or pictures should be copied with a portrait lens, or a single lens *made on purpose* for such work. Perhaps some of the information on Fothergill's process, given in this number, may help you.

Argentum.—Precipitate the silver from the liquid, by placing in it clean strips of metallic zinc. Collect the precipitate, wash it, and add it to the ashes of the silvered paper, and then proceed as recommended to T. Clark, at page 96.

Photo.—Has our correspondent tried filtering the bath, amongst "every means to remedy the evil"? That seems the most likely cause of the spots.

Argentum (G. J. J.)—Cyanide of potassium is the best remedy for photographically-spotted shirt fronts.

Communications declined with thanks:—K. W.—Alpha—X. Y. Z.—Gregory H.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—Printing Bath.—J. C —W. H.—Farquarson.—G. R. S.—Querist.—W. K.—Ellen.—W. J. M.—E. B.

In Type.—T. Barrett.—J. Nicol.—Euphos.—H. C. J.—J. C. S.—Sensitive Sol.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

Vol. I., No. 11.—*November* 19, 1858.

APPROACHING EXHIBITIONS.

NO. II.

The season for photographic exhibitions is fast approaching; and, judging from the reports which we have from all parts of the country, there is a likelihood of a greater number being held this season than at any time since the discovery of Photography. The exhibition of the London Photographic Society will be held in the Gallery of the Society of the British Artists, in Suffolk-street, Pall Mall. In our fourth number we took occasion to remark upon a somewhat strange resolution passed by the council of the Photographic Society. We did this the more readily because many photographers had addressed us on that point; and not having space to insert the numerous letters, we made the subject one of more special remark. Not only were "remonstrances" addressed to us personally, but, we believe, to the Council of the society, who then modified their resolution by announcing, that it was "not intended to exclude the works of our photographic brethren exhibited at tho exhibition in Edinburgh, which opens in December." We were glad to perceive from the foregoing that the Council had seen the sense and justice of our remarks, and therefore we are not a little astonished at hearing what is tantamount to a repetition of the original resolution. They intend to abide by their former resolve. We cannot help differing from them in regard to their opinion, that the resolution is one "which is conservative of the dignity and professional interest of the photographer." In our fourth number we plainly showed that it certainly was not promotive of the photographer's "interest;" as, on that occasion, speaking of the resolution, we said, that "It seems to us to be a most effective attempt to defeat the object of exhibitions, because it will easily be seen, that to exclude a photograph from an exhibition simply because it has been exhibited in shop windows is a most arbitrary regulation, since many of our leading photographers have their respective publishers; and it is not likely that a publisher would so far forget his own *interest* as to withhold the publication of a photograph until it has been exhibited at the society's exhibition." Nothing can be more apparent, that it would not be promotive of the photographer's "interest" to keep a photograph until it was seen at the society's exhibition. The absence of novelty in the contents of the last exhibition, no doubt, called for a stringent regulation, requiring that no pictures should be re-exhibited in any subsequent exhibition; as nothing was more apparent, than that the exhibition conveyed very little of the "photographic intelligence" with which it is now proposed to cover the walls of the Photographic Society's exhibition. It remains to be seen with what amount of impartiality previously-exhibited photographs will be excluded.

We are glad that the exhibition at the Crystal Palace is to be reinforced with the collection after the Suffolk-street rooms close. We showed very plainly, in our review of the Crystal Palace Photographic Gallery, that it greatly needed something worthy of the place and the art. It has been suggested, that, at the forthcoming exhibition, an effort should be made to obtain a complete series of photographic engravings. This suggestion is well worth the consideration of those who may be appointed to superintend the exhibition; and it ought, we think, to be carried out in a similar manner to that in which the Manchester Exhibition was arranged, viz., chronologically. That was, probably, one of the greatest charms of that noble collection, as the art student was thus enabled to see and study the early works of the masters of each country where the arts had flourished, and continue his study of *chefs-d'œuvre* representing a space of many hundreds of years, in the gallery of ancient masters. While in the modern, or English school, there were specimens of almost every master of note from the time of its foundation. This arrangement was carried out uniformly in every department except the photographic gallery, where, we are sorry to say, not the slightest arrangement, as regards chronological order or the classification of subjects, was observed. This is to be regretted, as a great opportunity was thus lost of displaying the wonderful resources and progress of photography. In the present instance, the suggestion of forming a gallery of photographic engravings might be carried out with very little effort, by collecting the earlier attempts of Mr. Fox Talbot; the photo-galvanographic prints; the productions of M. Poitevin and other French photographers; and, lastly, some specimens of the more elaborate and beautiful photoglyphic process, which we have recently given our readers an opportunity of inspecting for themselves.

The Architectural Photographic Association open their exhibition in December, in the gallery of the Old Society of Painters in Water Colours, in Pall Mall. The display, we have reason to believe, will greatly exceed that of last year. We shall revert to this subject in a future number. The object of this association is to present to its subscribers a number of photographs of the finest specimens of architecture in the world. It is carried out upon the Art Union principle. The late exhibition was the first that the association has held, and hence the inexperience of its managers may account for some apparent irregularities which characterised their proceedings. The committee who had the management of the association had first to obtain subscriptions to a certain amount before operations could be commenced; and the advantages which were held out to the members were, that they would be entitled to a number of good photographs in lieu of their subscription. As they obtained a large amount of money, thus subscribed, in advance, the committee were enabled to contract with photographers for a number of copies of their photographs at a low price Taking into consideration probable expenses, a little additional charge was placed on the photograph, which was marked accordingly. The irregularity is as follows:—A visitor might enter the exhibition, and purchase a catalogue; he had then an opportunity of seeing whether there were really any pictures which he would like, and which would make up the value of his subscription *before he subscribed;* and, by this means, the stranger who saw before he bought, was placed upon a better footing than one who had some time previously subscribed in order to carry on the undertaking. Unless it is stated that this will be remedied this year, it will most effectually lead to the extinction of the society, as nobody will care about subscribing before he sees whether he can really obtain the value of his subscription; and thus there will be, eventually, no funds in advance with which to carry on operations. It is clear, that some decided advantage should be held out to the public in order to induce people to subscribe beforehand.

A reference to our advertising columns of last week would enable our readers to perceive, that the photographic society which has recently been formed in Nottingham, under the presidency of his Grace the Duke of Newcastle, contemplate

opening an exhibition about the 20th of next month. This society, during its short existence, has been carried on with some vigour; and we have no doubt that the first exhibition of the society will be creditable to them as a beginning.

PHOTOGLYPHIC ENGRAVING.

We observe that a contemporary has spoken in somewhat depreciatory terms of the invention of Mr. Fox Talbot, which we have been the means of bringing so prominently before the public. His objections to the process are not very clear, and appear to have been made before he had seen any proofs printed from plates engraved by the new process. He asserts that half-tones cannot be rendered except by the introduction of an aquatint ground, and that, therefore, to obtain a pure photograph in carbon from such plates, is an absolute impossibility. Such an objection appears to us to be hypercritical. What does it signify by what means the various gradations of light and shade are produced, since the result is a fac-simile of the photographic picture? We have before us a print—one of many hundreds which were taken from the same plate. The subject is, a view of that portion of the Seine at Paris which includes the floating baths, &c. In this engraving the half-tone is as perfect as could possibly be expected from a new invention, even by the most exacting photographer, and far more perfect than anything we have yet seen from a plate engraved by the heliographic process which had not been subsequently operated upon by the hand of the engraver. We select the plate in question, though we think it is not the best in an artistic point of view, because it furnishes the strongest evidence of the exceeding correctness with which the photograph is reproduced, even in its most minute details. For example, in the left-hand corner of the engraving there are the following words on the front of a house, which are invisible to the unassisted eye and yet distinctly visible on the application of a magnifying power:—"Caoutchouc vulcanise.—Secretan, opticiens;" and on the house near it the words, "Chevallier Ingenieur, opticien." It seems to us that this furnishes abundant evidence that the engraving is, to all intents and purposes, a fac-simile of the photograph; and it is not of the slightest consequence to the public how Mr. Talbot produces this result. It is enough to know that it is accomplished by chemical means at a small cost, and that the engravings obtained by it are unrivalled by any means employed hitherto. Of the probable advantages to be derived from the discovery we have already spoken, and it is not necessary, therefore, for us to go into that question again at present. When Messrs. Soulier and Clouzard have succeeded (and we have no doubt they will succeed) in obtaining a perfect glass positive of sufficient dimensions, we shall have the pleasure of offering our subscribers a plate which will remove all doubt which may exist as to the value and importance of Mr. Fox Talbot's invention.

FOTHERGILL'S PROCESS.

BY MR. J. NICOL.

In a recent number of the "News" you requested some information on "Fothergill's process," and, although the invitation has been responded to from one or two quarters, perhaps you may still find room for a few words from me on the subject.

I have tried almost every dry process that has been published, and many that have not been so, and consider Fothergill's much better than any of them. In my hands, at least, it is more certain, more sensitive, more easily managed, and more valuable than all the others put together.

After many experiments I adopted the following method of manipulation, and as a testimonial in its favour may state, that since its adoption I have prepared many plates for my own use, and many more for sale; and my own experience, and the reports of my customers, warrant me in saying that, with proper care, a dozen plates will always give a dozen good pictures. The very gateway of success is a suitable collodion. The pyroxyline I prepare by taking—

Nitric acid, S. G. 1·500	12 ounces
Sulphuric acid, Commercial, S. G. 1·845,	14 ounces
Water	3 oz. and 6 drachms

raising the temperature to 150°, adding the cotton gradually and allowing the action to go on for five minutes, then washing till every trace of acid is removed.

The collodion consists of this:

Pyroxyline	4 grains.
Iodide of cadmium	2 grains.
Iodide of ammonium	2 grains.
Bromide of ammonium	1 grain.
Sulphuric ether, S. G. ·750	6 drachms.
Alcohol, S. G. ·800	2 drachms.

My bath is made of fused nitrate of silver, and contains forty grains to the ounce. It is *very* slightly acid. With a neutral bath I have always found a want of brilliancy in the shadows.

I prepare albumen by taking

White of eggs (very fresh)	5 ounces
Distilled water	5 ounces
Strong solution of ammonia, S.G. ·882	½ drachm

This I put into a bottle, holding at least twelve ounces, and shake for about half an hour. In half an hour more it will be settled and ready for use. It will keep good for at least a fortnight, but when a few days old, should be filtered through sponge just before using.

So much for the material; now for the manipulation, which may be separated into five operations:

1. I coat the plate and sensitise in the usual way, and drain on blotting paper for half a minute.

2. Place it in a bath containing five grains of nitrate of silver to the ounce, move it about for half a minute, drain, and wipe the back with blotting paper.

3. Attach a pneumatic holder and pour on carefully (for stereoscopic size) three drachms of distilled water; keep this moving over every part of the plate for a few seconds, and pour off.

4. Pour on one and a half drachms prepared albumen, and cause it to flow backward and forward for a minute, making sure that it has been in contact with every portion of the surface before pouring off.

5. Wash off the albumen by pouring very gently at one end, and sliding the glass from corner to corner, four ounces of water, drain, wipe the back, and set up on blotting paper to dry.

The second bath may seem an unnecessary addition to the more general method of doing the whole washing at one operation, but in reality it is not so; the difficulty of getting the water to flow evenly over the plate just removed from the sensitising bath is altogether obviated, and the risk of unequal washing avoided.

The accompanying picture was taken two months ago, in forty seconds, in weak sunshine, on a plate five weeks old, with a single lens of seven inches focus and $\frac{5}{16}$ stop.

I have recently been experimenting with a view to drying by artificial heat, and, thinking it may be applied with advantage, have set about devising an arrangement for that purpose. It consists of a light-tight box eighteen inches high, nine inches deep, and eighteen inches broad. Three inches from the bottom there is a shelf of perforated zinc, supported on several cross wires, and covered with two or three plies of blotting paper. On each side there is a slip of wood with four notches two inches apart, intended to support four glass rods at a height of six and a half inches from the zinc shelf. Between the shelf and the bottom there is a steam-tight tin pan, two inches deep, and the full size of the box. The only opening to this is a tube coming through the side of the box. This is attached by a coupling to a tin tube which is attached to the tube coming from the still-head of an ordinary distilled-water apparatus; or, what will

answer just as well, the spout of a tea-kettle. The plates rest on the blotting paper, and lean with one edge against the glass rods, which should be movable, so that in commencing all but the last may be taken out and a fresh rod put in as each row is completed. Near the top of the box there should be a small shelf on which is placed a dish containing some quick-lime, which will absorb the moisture as it is driven from the plates. To complete the whole a thermometer bulb may be inserted through a hole in the top, and with a "bunsen burner," or even an ordinary gas jet placed below the still or tea-kettle, the temperature may be regulated at pleasure. By-the-bye I had almost forgotten a word about developing. Gallic acid gives the best picture, but it is so tedious in its operation that I have laid it aside. Pyrogallic acid is the thing, and I am at present most successful with

Pyrogallic acid	1 grain.
Glacial acetic acid	10 drops.
Alcohol	10 drops.
Water distilled	1 ounce.

In warm weather twenty drops of the acetic acid will be required, but at this season the retarding effect of such a quantity is too great.

I level and moisten the plate, and to six* drachms of the developing solution add four drops of solution of nitrate of silver, half a drachm to the ounce, pour on and keep it constantly moving. This will very often be found sufficient for the whole operation; but should it get dark and seem to be acting very slowly, or not at all after a time, it should be thrown off and a fresh quantity applied.

I fix with hyposulphite of soda, three or four ounces to the pint, and varnish with a solution of gum benzoin in alcohol.

Edinburgh.

P. S.—I should have mentioned that the measurement of the drying chamber is for stereoscope plates, and that with it four dozen may be dried at once.

* For stereoscope plates.

PHOTOGRAPHY IN ALGERIA.

NO. III.—(*continued.*)

I was obliged to admit to myself that there was very little chance of my presence on the plateau being unknown, the presence of the horses, and their being tethered, would have told the thief that somebody must be in the neighbourhood, and there was no difficulty in the way of anybody seeing my tent from the wood without my seeing him; besides, he might have come close to the tent while I was inside without my being aware of it. There was one source of consolation, and that was in the thought that the thief might have no friends within reach, and might be so well satisfied himself with the spoil he had already got, as not to return. Of course I had not ventured out without that light revolver of Tranter's with which you are familiar. The sheikh had especially cautioned me on that matter; some of the Arab tribes looking upon it as an honour to take a man's life without the slightest provocation, and from precisely the same motive as inspired Cooper's noble savages in their hunt for scalps, whether of men, women, or children: the estimation in which such an Arab is held among his tribe being in proportion to the blood he has shed. But though I was armed, I had not the least inclination to take the life of any human being; on the contrary, the intense dread I have of giving pain to any living thing is such that I should be ashamed to acknowledge it to the people among whom I am now living; but I soon found the justice of the observation made by the French lady when the priest told her, with emphasis, that Saint Denis had walked two whole leagues with his head in his hand,—that in such cases "the first step is the only difficulty," as you will see.

If there had been a certainty of my reaching the camp in safety by walking, I would have hidden my camera, secreted my negatives in the best way I could, and have started off; but the chances of my doing so were very problematical, as some of the natives who had been dispersed by the French troops were pretty certain to be prowling about as near the camp as they dared, in the hope of picking off a straggler. It was already dusk, and would be dark before I could get clear of the wood, so I was obliged to give up that idea, and wait, with as much patience as I could command, for the return of the Arab, who I felt certain would be accompanied by the sheikh. As an additional means of sustaining my equanimity I did what every man who is accustomed to be much alone is sure to do—I filled a meerschaum, and commenced smoking. I was sitting inside my tent, which was partly open, my revolver lying on my knees, when I heard a report, and almost simultaneously there was a commotion among my teeth, and a jingling among my chemicals. The shock I received was so sudden, that, from some cause or other, probably fear, I did not stir; nevertheless, I had presence of mind to take up my pistol, and, in what was probably a few seconds, but which seemed to me a very long time, I saw the muzzle of a gun projecting from behind a bush, and then the figure of what appeared a naked man came cautiously forward in the direction of my tent. I was even at that moment undecided what to do; I did not like the idea of shooting him, and if there had been any hope of making myself understood by him, I believe I should have tried the effect of a parley. He came sneaking along—in this respect also resembling the *noble* savage—thinking, no doubt, that his shot had taken effect. The mouth of the gun was within a yard of my body, when, almost mechanically, I raised the pistol and fired. The gun fell to the ground, and I had just time to move my legs a little aside out of the way of the body when it fell heavily to the ground beside me. I was seized with such horror that I sprang up and ran off towards the ravine. Soon, however, other thoughts—thoughts as to my own safety—made me think with indifference on what had just occurred; so powerful is the feeling of self-preservation. From what I had heard of the manners of the Arabs, I knew there was a possibility of the man whom I had just shot being alone, and that he was the thief who had stolen the horses, and whose greed had induced him to return alone, that there might be none with whom he would have to share the plunder, thinking, probably, there would be little difficulty in shooting a man whom he might attack unawares; and certainly, if I had been sitting outside my tent instead of inside, where it was impossible to see me at a few yards distance, I should not now have the pleasure of writing to you, nor would you, or any of my other friends, have ever known that my bones were bleaching on a mountain in Africa. At the same time there was the knowledge that the recent defeat of the Arabs had scattered them about in the vicinity, for these men when defeated never go right away at once, but hang about the spot under shelter of the bushes and rocks until the victors have retreated, and there was every probability of the report of firearms bringing them to the spot. There was no way of escape open to me; the small bit of table-land on which I was, was bounded on one side by the deep ravine, the side of which was almost perpendicular, and, with the exception of two or three little shrubs at considerable distances from each other, offered no salient points for the hand or foot; and on the other by the thick trees, which inclosed me in a semicircle. My feelings, as I waited in the momentary expectation of an attack, were in truth indescribable, for I really do not remember what they were. I recollect that I felt an intense dread of dying, not so much, I fancy, at the thought of death and its consequences, as of the pain I must suffer before death.

My pen is not that of a ready writer, or I might describe what followed in the style of an author with whose works you are familiar, thus:—I placed myself with my back to the ravine, and determined to sell my life dearly. In that moment, with death staring me in the face, the image of the old

house rose up before me, with my kind old father sitting beside the fire in the familiar room he called his study. There hung the well-remembered whip with which, when a boy home from college for the holidays, I had thrashed the biggest bully in the county. There, too, &c., &c., &c.

Or, perhaps, a graver style would be better suited to the occasion—dropping the first person and assuming the third, thus:—Darkness was spreading her sable wings over the earth, and the dazzling orb that bears the name of her who erst on Ida's mount received the golden apple, prize of the fairest, gentle Aphrodite, shone with a lustre unknown in colder lands and more cloudy skies. The bold and daring photographer (the real Prometheus, who seizes heaven's light and devotes it to his will) gazed at the lifeless corpse from which the soul had been divorced by his hand. A solemn awe stole over his spirit—the awe which the living feel in darkness beside the bodies of the dead; . . . . and so on *ad lib.*

Perhaps you may think I speak of the matter with too much lightness; but believe me I feel as deeply grateful to the . . . .
In plain language, what really passed was as nearly as possible as follows:—I prepared myself as well as I could for the encounter, which seemed more imminent every moment. I wished myself at home, or anywhere than where I was; and altogether I passed a "*mauvais quart d'heure,*"* before I distinguished six or seven half-naked Arabs creeping along through the bushes. It was very difficult to make them out, in consequence of the trees in the background; but one's eyesight, as well as some other faculties, are rendered much more powerful by peril, and certainly, I fancy, I was never much nearer death than at that moment. I lay perfectly still behind a bush, and watched their gradual approach to where I was concealed. At one time they drew together and held a conversation, and I began to entertain a slight hope that they were about to give up the search; but just then one of them appeared to draw attention to the tent, and there was a hasty move towards it. I guessed they had discovered the body; and a minute or two afterwards I was convinced of it, for one of them flashed some powder in a pistol, and set fire to a piece of rag, I presume for the purpose of examining the face. They were in the act of conferring together, when I heard the trampling of horses; and forgetting that these fellows might have companions on horseback, I concluded at once that it was my friend the sheikh, and jumped up from my hiding-place and moved in the direction of the sound, and was very near losing my life in consequence, for the natives round the tent caught sight of me, and there was a pretty general discharge of firearms. Fortunately I was not mistaken in supposing that it was the sheikh, who, together with his brother and three of his men, had come to seek me. There was a good deal of firing for two or three minutes on both sides, and my revolver was not silent during that period; but less mischief was done than I expected. On our side there was one man wounded, and on the other there was one shot dead, and another left on the ground unable to escape, and who, I am afraid to say, was disposed of quietly by one of the Spahis. My camera and the other apparatus was divided among the party, and I mounted behind Hamed *en croupe*. Of course I had to relate all that had taken place, and they listened to the tale with as much of coolness as if it had been a matter of everyday occurrence. In the matter of coolness I imitated them; but I made a resolution in my own mind—and I don't think I am likely to break it either—that if ever I accompanied another expedition, I would take care never to place myself in a similar position.

My first thought on reaching the camp was of my negatives. I opened the case, and—not to my surprise, certainly, for I rather expected to find something of the sort—but, to my great vexation, I found that the ball had cracked three of the negatives, and had finally lodged in the collodion bottle, the contents of which slightly injured some others. I think now that I have cause to rejoice in having saved any, and I hope I shall have the pleasure of seeing them at the Photographic Society's rooms, in your company, when I return to England—that will be some compensation for the peril I incurred in getting them.

Long before you receive this letter I shall be on my way to Hamed's douar. Whether I shall be able to send you a letter from there is doubtful; but if it be possible, you shall hear from me.

Remember me to . . . . , and if there is anything in this letter which strikes you as being egotistical, pray don't publish it. There is, as you know, nothing I dread so much as being even suspected of boasting.—Very truly yours,

C. A.

P.S.—If you know, or hear of, any photographer coming out here, will you endeavour to send me as much collodion of ——'s make as he will be kind enough to take charge of?

* For the benefit of our younger readers we may mention that "*un mauvais quart d'heure*" is an idiomatic French phrase, the meaning of which will be sufficiently evident from its literal translation—"a bad quarter of an hour."—Ed.

PREPARATION OF IODIDE OF POTASSIUM.

BY BARON VON LIEBIG.

One of the most ordinary methods of preparing iodide of potassium consists in mingling, by weight, three parts of iodine with metallic iron and water; then filtering the solution of iodide of iron which results, treating it with another part of iodine, and precipitating the iron with carbonated or caustic potash, when the solution is complete; at the same time a black oxide of iron deposits itself, and is washed with facility. This process, executed on a large scale, presents some inconveniences. The solution of the iodine, and its transformation into iodide of iron, is effected very slowly: the liquid must be heated, much water used, and the operation must be performed in a porcelain or glass vessel, because, if an iron one be used, the per-iodide changes rapidly into proto-iodide; and the purposed object, which is to convert the iron into magnetic oxide, is not attained. Now this difficulty may be overcome by a slight modification.

The iodide of iron is first prepared as above mentioned; but instead of dissolving the other third of iodine in the iodide, it is dissolved in a weak solution of potash; or, if it be desired to prepare the iodide of sodium, in dilute solution of soda, and by means of this solution the precipitation of the iodide of iron is proceeded with. The quantity of the alkaline solution should be a little less than would be required for the complete precipitation, which is concluded with a suitable dose of alkaline carbonate. The precipitate, under the form of a bulky voluminous mass, appears to be of a very unequal composition; but if left in obscurity, and frequently shaken, the protoxide unites perfectly with the peroxide, and forms the *magnetic* oxide, which by two or three washings is completely freed from the alkaline iodide. If, to form the iodide of iron only two parts of iodine instead of three be employed, and a third part be dissolved in the caustic alkali intended for the precipitation, hydrated oxide of iron is obtained, which is very fine and pure, and can be easily washed, though less readily perhaps than the magnetic oxide. Baron Liebig is of opinion, that this method will obviate the losses sustained by other modes of preparation.

THE STEREOSCOPIC ANGLE.

An extract which we made from the *Literary Gazette*, in vol. i. p. 15, on the "Stereoscopic Angle," has caused a discussion of some scientific importance in our columns. At vol. i. p. 98 appeared a reply to that extract by Mr. Lake Price, which called forth an able letter from a most eminent scientific gentleman, under signature of "J. F. W. H," p. 110.

In the last issue of our excellent contemporary there is a

reply to Mr. Price's letter, which we feel it right to extract, that we may put our readers in full possession of the discussion, as it is one which must be interesting to all scientific photographers. Our contemporary states:—

"In a review of Mr. Lake Price's 'Manual of Photographic Manipulation' (*Literary Gazette*, August 7), we took occasion to make some remarks on the subject of what are called Stereoscopic Angles. Mr. Price laid down the rule that, for objects beyond ten feet from the eye, the cameras used in taking stereoscopic views must be placed farther apart in proportion as the distance of the principal object increases. For a view, for example, in which a mountain was ten miles off, the cameras should be fifty yards apart. This rule, we said, was based on an erroneous principle; and we endeavoured to show that, whilst a greater appearance of relief would unquestionably be given by increasing the distance between the cameras, the only possible means of obtaining a strictly-faithful representation of any view or object as it would be seen by both the human eyes at once, is to have the lenses of the stereoscopic cameras about the same distance apart as the human eyes are. Our excellent contemporary, the '*Photographic News*,' did us the honour to transfer our remarks to its pages, and last week, after an interval of nearly three months, that journal contained a long letter in reply from Mr. Price, in which he says that he is 'quite prepared to maintain the statement that he made in his book.' It would be inconvenient, and, indeed, impossible, to carry on a discussion after any such fashion as this; but there is, in fact, no room for discussion in the matter. Mr. Price 'maintains' his former statement, and maintains something more, for he goes on to say, 'I maintain that if you attempt to give any stereoscopic representation of the sun THREE THOUSAND MILES or more (the capitals are his own) would not be too much for the cameras to stand apart.' But he does not make the slightest allusion to fidelity of representation, on which our remarks entirely hinged. We never doubted, but, on the contrary, expressly stated, that greater 'rotund effect,' as he calls it, would be obtained by the separation of the cameras. Our proposition was, that a strictly true representation could only possibly be obtained by having the lenses of the camera or cameras the distance of the human eyes apart, whatever the distance of the principal object might be. We admitted that, for particular purposes, scientific or otherwise, an exaggerated relief might be desirable; but we urged, in the interest of truth, that in such cases the stereographs should bear on them a statement of the fact. Mr. Price has simply misconceived the argument."

PHOTOLITHOGRAPHY.

Mr. W. E. Newton has taken out a patent for what is described as, "An improved process for producing photographic pictures or designs on the surface of stone or metals, so that impressions may be taken therefrom by the process of lithographic printing." We have not space for the specification, but we will sum up as briefly as possible its principal features. A lithographic stone, or zinc plate, is coated with a solution composed of 1 quart of water, 4 ounces of gum arabic, 160 grains of sugar, and a like quantity of bichromate of potassa. The stone thus prepared is kept in the dark until dry, and is then exposed in the camera, or the picture is laid upon it and printed upon it, by the action of light. The effect of the luminous action is, to render the gum almost insoluble. The stone is then washed with a solution of soap, the coating is readily removed from those parts which have not been acted upon by the light, the soap is decomposed on the surface of the stone, and a printing surface is formed: "the action of the soap being inversely proportionate to the extent to which the gum was fixed by the light." The stone thus prepared is washed with water, and when dry receives a coating of printer's ink from the roller, which, by uniting with the soap, gives additional body to the picture. When variations of light and shade are required, the surface of the stone is roughened, but this is not necessary when only blacks and whites are required. The specification is rather comprehensive, for it declares the proportions of the ingredients given above not to be rigid, while various substances, not decomposable by bichromate of potassa, may be substituted for the sugar; and the coating not acted upon may be removed by other solutions than that of soap. Nevertheless he will consider the employment of any of these processes an infringement of his patent.

This process has been in use for some time past by Messrs. Cutting and Bradford of Boston, U. S. The difference between this process and that of M. Poitevin, as described in the "Photographic News," vol. i. p. 106, is, that in the former the ink adheres to those parts of the stone upon which the light has not acted, whereas in the latter it adheres to those parts where the light has acted.

PRESERVATIVE PROCESS WITH RASPBERRY SYRUP.

The following letter appeared in the *Times* of Wednesday, the 17th inst. We may state that the reverend gentleman there mentioned is one of our correspondents, and a frequent contributor to the pages of the "Photographic News." We were in possession of all the information contained below some months ago, but as our success with the process was very uncertain, we did not consider it advisable to place the process before our readers, especially as the employment of so remarkably indefinite a compound as an article of confectionery seemed to us a step in the wrong direction.

"*To the Editor of the Times.*

"Sir,—The Rev. J. Lawson Sisson, who resides at Lausanne, and whose excellent 'turpentine-waxed paper' negatives are well known to photographers, has communicated to us a new 'dry' collodion process. As this process is certain and simple —even more so than the 'Fothergill' process, which you published some months since, and as the specimens we have seen enable us to say that it is unquestionably successful, we ask leave, through your columns, to give the following description of the manipulation.

"The plates which it is intended to prepare being properly cleaned, proceed thus: Have four dishes of the usual kind, in three of them put sufficient filtered rain water (distilled water would be better) to thoroughly cover a plate, in the fourth dish put about the same quantity of raspberry syrup and water, in the proportions of ½ ounce of syrup to 3 ounces of distilled water. (The raspberry syrup, which there are chemical reasons for using, is that usually sold by confectioners.) Arrange the dishes side by side, the syrup dish being last. A plate is then coated and sensitised in the ordinary manner, and is put, film upwards, in the first water dish. A second plate is coated and sensitised, and when ready to be lifted from the nitrate bath, the first plate is removed to the second water dish, the second plate being put in the first water dish. A third plate is then prepared, and plates one and two moved on to the adjoining dishes; then a fourth plate is sensitised, and at this stage plate one is immersed in the syrup dish, and plates two and three in the second and third water dishes. After preparing a fifth plate, plate one is ready to be lifted from the syrup dish, and is then placed upright upon blotting paper, to drain and dry.

"In this order the process is continued, the time required for coating and sensitising a plate measuring exactly the time any other plate shall remain in one of the four dishes. The plates will keep as long, and, in use, are quite as sensitive as those prepared by any of the existing keeping processes; there are no blistering or albumen difficulties, nor is any special condition of collodion or bath requisite.

"Mr. Sisson uses the ordinary pyrogallic developer, merely, in the first place, putting for a few seconds a little water on the negative.—We are, sir, your obedient servants,

"*Nov.* 16." "Murray and Heath.

A New Property of Freshly-calcined Charcoal.—The solutions of silver in nitric acid, whether neutral or acid, and chloride of silver dissolved in ammonia, are easily decomposed by freshly calcined wood charcoal. The silver is soon seen to cover the charcoal in the most beautiful manner; it sometimes appears crystallised.—*Comptes Rendus.*

Photographic Chemistry.

NATURE OF THE METALS.

(*Continued.*)

Bismuth is a metal not used in photography as yet. Its principal use is in alloys, as it communicates fusibility to other metals. An alloy composed of 5 parts of bismuth, 2 of tin, and 3 of lead, can be used for taking impressions from seals, gems, and any hard-engraved surface. It is from an alloy of this kind, with the addition, probably, of a little mercury, that those spoons are made which, if used to stir a cup of very hot tea, surprise the holder by melting away.

Arsenic is a grayish-white metal, of a volatile nature; if thrown on red-hot charcoal it burns, and at the same time gives out a strong odour of garlic; the result of the combustion is a white-coloured oxide, commonly, though improperly, called arsenic. Somewhat similar to arsenic in some of its properties, is the new metal discovered by Sir J. Herschel, and named by him junonium, a description of which is given at p. 86, vol. i., of this journal. In sensitiveness to light, its salts equal any known substance; but further experiments are necessary before it can be known how far it can be rendered available for photographic purposes.

There are some other metals beside those we have enumerated above, but they do not appear to us, either in themselves or combined with other substances, to be available for photographic purposes. Indeed, some of those we have treated of are not at present used; but we have thought it advisable to describe them, as a knowledge of their composition may lead to the discovery of some method by means of which they may be rendered useful servants of photography. The discovery of Sir John Herschel, referred to above, as well as the application of the nitrate of uranium to the printing of positives, are arguments in favour of the course we have pursued.

METALLIC OXIDES.

We shall now proceed to offer a few remarks on the oxides. The oxides formed by the combination of metals with oxygen may be classed as basic, neutral, or acid. The *basic* metallic oxides are those which unite with acids to form salts; such are the oxides of potassium, calcium, sodium, and silver, which yield the salts of potassa, soda, lime, and silver. Each metal furnishes at least one base; that is, an oxide capable of uniting with acids to form salts. The *neutral* metallic oxides are those which have no tendency to unite either with acids or bases. The *metallic acids* are those which unite with bases to produce salts: thus the acids called manganic, permanganic, chromic, perchromic, and stannic, which are combinations of manganese, chromium, and tin with oxygen, give, with potassa, the manganate, permanganate, chromate, perchromate, or stannate of potassa, &c.

Oxides are reducible to their metallic state either by the action of heat, as in the case of gold, silver, &c.; or by the intervention of carbon or hydrogen, at a more or less elevated temperature; or by means of a metal which has a greater affinity for oxygen. Thus oxide of copper may be reduced by hydrogen, and water will be produced by carbon, and there will be a production of carbonic acid by iron with a production of oxide of iron.

Metals may also be abstracted from their sulphates, chlorides, &c.; thus the sulphate of silver, and the sulphate of lead, may be reduced by iron with the production of sulphate of iron, and it is on these reactions, and chiefly on that of carbon, that metallurgy is based.

Oxides may likewise be decomposed by sulphur, chlorine, phosphorus, &c., especially if the assistance of heat be called in; these bodies take possession of the metal to form sulphides, chlorides, phosphides, &c.

The oxides of the alkaline and earthy-alkaline metals are all soluble in water; they form energetic bases; they are: potassa, soda, lime, baryta, and strontia. All the other oxides are very nearly insoluble in water; the soluble oxides, and more especially soda and potash, have received the name of *alkalies*.

Salts are formed from the combination of acids and bases. Salts, of whatever nature they may be, whether oxygenised or not, present certain characteristics which it is requisite to know. They are almost all solid, and generally white; or, at all events, free from any decided colour. When they are deposited in a solution, they usually affect a regular form peculiar to them, which is termed the *crystalline* form. Some crystallise in water without combining with it; others, on crystallising, take up a certain quantity of water, which is termed *water of crystallisation*—the hyposulphite of soda, for example. There are some which absorb moisture from the air, as the chloride of calcium, and these are denominated *deliquescent*. Others, on the contrary, lose on contact with dry air the whole or part of their water of crystallisation, like the carbonate of soda; these are termed *efflorescent*. Some salts decompose under the influence of light, instances of which are furnished by certain salts of mercury, and the salts of silver.

(*To be continued.*)

Dictionary of Photography.

ACIDS AND ALKALIES (*continued*).—Acids attack and dissolve all metals with but few exceptions. The rapid and violent solution of silver in nitric acid, in the formation of nitrate of silver, is a familiar instance of this kind of action. In their most concentrated form nitric and sulphuric acids act violently on the skin, and all other animal or vegetable matters, producing instant destruction of it. Strong solutions of potassa or soda have scarcely less destructive action; and either of these alkalies readily attacks and dissolves the skin. They both have also the property of dissolving the glaze from the surface of the commoner kinds of earthenware, and, also paint from any vessel in which their solutions remain for any length of time.

The most remarkable property of these two classes of bodies, is, however, their great tendency to enter into combination with each other and form new substances, in which the peculiar and characteristic properties which distinguish both acids and alkalies in the free state are entirely masked.

If a red cabbage be cut up in slices, and then boiling water poured over it, the purplish liquid so produced will be good for trying a variety of experiments, which will serve to illustrate the various properties of acids and alkalies. Take some of this solution, and add to it a few drops of dilute sulphuric acid, the purple colour instantly changes to red. Now add to another portion a few drops of ammonia, and a green solution will be formed. If this latter solution be now added by degrees to the red liquid, the green colour of the first portions added will at once disappear, and the liquid will remain red; gradually, however, as the ammonia neutralises the acid, the red colour will pass into a purple, and at length will become of a clear blue tint, showing that all free acid and alkali have disappeared. On evaporating the liquid to dryness, a neutral crystalline mass of sulphate of potassa, formed from the union of the sulphuric acid with potassa, will remain. The term which is applied to this, and to all other compounds formed by the union of acids and alkalies is, a *salt*.

Besides acids having the characters of those which we have mentioned, and which are easily dissolved in water, there are some which are gaseous, such as carbonic acid: others are solid, but nearly insoluble in water, such as arsenious acid, the *arsenic* of shops. Others again are quite insoluble in water, such as silicic acid, or common flint. All these in chemical language are true acids, although, when insoluble, they can have no sour taste or acid reaction on vegetable colours. Chemically speaking, acids are bodies which are capable of combining with alkalies and forming salts.

All true alkalies are soluble in water. The *alkaline earths*, such as baryta, strontia, and lime, which greatly resemble alkalies, are slightly soluble in water, and communicate to it an alkaline reaction. The same property is also possessed by the oxides of lead and silver, but in a much fainter degree. The numerous class of bodies, *basic metallic oxides*, are, with the above exceptions, insoluble in water; but they are easily dissolved by acids with which they unite, forming *salts*, which, usually, are well defined crystalline compounds, such as nitrate of silver, which is formed of nitric acid and oxide of silver; sulphate of iron, which is composed of sulphuric acid and oxide of iron; acetate of lead, which is formed of acetic acid and oxide of lead. All these bodies, whether soluble or insoluble, which, uniting with acids, have the property of neutralising them and forming salts, are known under the general term, *bases*, which term includes the alkalies and alkaline earths.

ACID SALTS.—Many compounds which are called acid salts from their having an acid reaction to test paper (such as bisulphate of potassa), should more properly be considered as double salts, in which *water* acts the part of a base. It may at first sight seem strange, but chemists generally admit that water acts, in very many ways, as if it were the oxide of a metal; and hydrogen very much resembles a metal in its chemical characteristics. Bisulphate of potassa, therefore, will, according to this view, become a double salt, composed of equal equivalents of sulphate of potassa, and sulphuric acid, or sulphate of water as we must call it. Water is one of the weakest bases; in fact, it is only now and then that its basic characters can be recognised. There are, however, a few true acid salts: bichromate of potassa is one of this class; for, as it contains no water, it cannot be looked upon as a double chromate of potassa and water, but must really be considered as a compound of two equivalents of acid to one of base.

(*To be continued.*)

A Catechism of Photography.

CALOTYPE—(*continued.*)

Q. HAS the process, as originally practised by Mr. Talbot, undergone any modification?

A. The process has been improved as our knowledge of the science of photography has advanced.

Q. What was the original process?

A. The best writing paper of medium thickness was selected, cut to the proper size, pinned by two of its corners on a flat board, while, by means of a soft brush, the first solution was applied—the operation being, of course, performed in a room chemically dark.

Q. What was the first solution?

A. It was a solution made in the following proportions: 50 grains of nitrate of silver to 3 ounces of distilled water.

Q. After the application of the solution, how did the operator proceed?

A. The paper was allowed to dry; when thoroughly dry, a portion of another solution was poured into a shallow dish, on this solution the prepared side of the paper was gently and smoothly laid until thoroughly saturated, in which condition it was allowed to remain for a few seconds.

Q. What were the component parts of this second solution?

A. A solution of 250 grains of iodide of potassium in one half pint of distilled water. The addition of common salt was afterwards made, and found to be a decided improvement. The proportions were, 100 grains of common salt to 400 grains of iodide of potassium.

Q. What was the succeeding process?

A. After being allowed to saturate for a few seconds the prepared paper was hung up to dry. But it was necessary to remove every trace of the salt with which the paper had been saturated. This was done by floating it on a basin of pure water for ten or twelve minutes, repeating the washing once or twice in clean water, by which the soluble salts were separated, and a single surface of iodide of silver was left upon the paper. Thus prepared, the paper was thoroughly dried and put away for future use.

Q. What was it called?

A. Iodised paper.

Q. When the paper was about to be used in the camera, was any further process necessary?

A. It was. Two solutions, previously prepared, were mixed in equal quantities.

Q. What were these solutions?

A. The first consisted of 100 grains of nitrate of silver in 4 ounces of distilled water, with a sixth part of its quantity of acetic acid. The second solution was crystallised gallic acid in distilled water. When these were mixed, they formed gallo-nitrate of silver.

Q. What was done with this preparation?

A. It was rapidly and carefully washed over the surface of the iodised paper so as to give a perfect and even coating. The surface was then dipped into some water, drawn across it three or four times, and dried with blotting paper; it was then fit for use, either at once, or at some future time.

Q. Could it be placed immediately in the camera?

A. It could be placed in the camera while still moist, and could receive a very perfect impression, the length of time being regulated by the intensity of the light.

Q. Was the picture visible when removed from the camera?

A. Only very slightly: it had to be developed, which was done by the following method:—The sensitive surface was washed over with gallo-nitrate of silver, and exposed, at the same time, to a gentle heat. After a few seconds a negative picture was developed, and from this negative any number of positives could be taken.

Q. By what means were positives to be obtained from the negative?

A. A piece of photographic paper was placed in immediate contact with the negative and exposed to the light.

Q. What sort of paper was to be used for this purpose?

A. Fifty grains of common salt were dissolved in two ounces of distilled water. Into this the papers elected for the purpose was to be dipped and allowed to soak for some time; after which it was to be removed, and placed between blotting paper to dry. Ninety grains of crystallised nitrate of silver were then to be dissolved in an ounce of distilled water; with this solution the paper was to be washed, and afterwards thoroughly dried. It was then ready for use, and upon its surface, when placed in contact with the negative, a clear, well-defined, and beautiful picture could be produced.

(*To be continued.*)

Correspondence.

AN EASY METHOD OF OBTAINING PHOTOGRAPHS OF HIGHLY MAGNIFIED MICROSCOPIC OBJECTS.

DEAR SIR,—I now send you a description of the process by which I obtained the negatives of highly magnified microscopic objects, the proofs from which I inclosed to you. My apparatus is very simple. It consists of a Stanhope lens, a double combination portrait lens, with ½ inch stop, and a large double camera made of deal, painted black, measuring about 2 feet 6 inches when drawn out, and about 11 inches square. It has focussing glass, and dark slide. A portion of the front of the camera is cut out, from the top nearly to the bottom, and grooves are attached beyond the sides of this opening for different fronts to slide down into a grooved stop. For the present purpose the front has a hole cut in the centre, which should be in the centre of the front of the camera, for the back part of the combination of lenses to pass through. Inside the large camera is a smaller one without a back, into which the lenses are screwed, the front

lens towards the focussing glass. This smaller camera must fit the inside of that part of the larger camera which slides in, so that it may be moved the whole length; and, as it will not quite fit the larger half when moved close to the front, a piece of black calico or cloth should be nailed round the edge, to keep out all light except that which passes through the lenses. It must also have a wooden screw at the bottom, to keep it from shifting when in the required position. The cap is not put on the lenses.

The Stanhope lens must be placed in a hole in the centre of a thick piece of gutta percha, cut the size of the back of the combination, and if the Stanhope lens is in a setting smaller in the centre than at the ends, by cutting the hole smaller than the ends, and passing a warm knife round the edge, the Stanhope lens can be pushed through, and the gutta percha pressed close round the middle of it, so that it will be quite firmly set when the gutta percha becomes hard. A broad piece of sheet India-rubber must be cut long enough to go round the brass of the back lens, and attached to the gutta percha so as to make an elastic cap; two strips of India-rubber must also be fastened at each end across the front of the cap, and placed above and below the Stanhope lens, so that the glass containing the microscopic object may, when passed through, be kept close up to the Stanhope lens. In passing the glass through these straps they must be pulled out a little, so that the glass may not scratch the lens, as the smallest scratch is greatly magnified. To prevent also the Stanhope lens from scratching the lens of the combination, to which it must go close when the cap is on, a piece of wash-leather should cover the inside of the cap, with a hole large enough for the *glass*, but not the mounting, of the Stanhope lens to pass. Having placed the object to be magnified exactly in the centre of the front of the Stanhope lens, and pushed the back part of the combination through the hole in the front part of the large camera, I place the cap with the Stanhope lens on it, and turn it towards the lightest part of the sky, or to the sun if shining. Then, by drawing out the camera, the magnified object appears on the focussing glass, which must be adjusted till the object is perfectly sharp and clear. The dark slide with the sensitised plate is then put in, and the sliding shutter drawn up. The exposure must depend on the light, and the transparency of the object. I find about a minute is sufficient if the light be good, and the object tolerably transparent, but less if the sun passes through the lenses. Some objects, such as the "section of the stem of the clematis," require short exposure, from the light passing through the holes of the sap tubes; others, as "the tongue of the bee," require longer exposure, being more opaque, and of a yellow brown colour. With some objects, as, for instance, "the flea," there is considerable difficulty, on account of the body being so much more opaque than the legs. If the negative is not as sharp as the object appears on the ground glass, there will probably be some difference between the visual and actinic foci of the lenses, and the right position for the plate must be found. I think this apparatus would be useful for examining the structure of the different samples of collodion; by placing a drop on the centre of the Stanhope lens, the structure is plainly seen on the ground glass. The collodion I use for this process is old, and gives a white creamy film after sensitising; 2 drops of pure glycerine should be added to each ounce. The silver bath is the usual 30 grain, *not* fused nitrate, as that, I find, is apt to make the negative very red and burnt if the light be powerful. The developer I use consists of—

Pyrogallic acid	6 grains.
Acetic acid	1½ drachm.
Water	8 ounces.
Alcohol	½ drachm.

Truly yours, T. Barrett.

[The remainder of our correspondent's letter, which will contain the details of an improved printing process, will be given next week.—Ed.]

PHOTOGRAPHY IN INDIA.

Sir,—On my return to England after a few weeks' absence, I am rejoiced to find the "Photographic News" in circulation. I lost no time in procuring the back numbers. It is, Mr. Editor, the very thing that was wanted; it is well calculated to promote photography, and I wish you every success. I practise photography a little when circumstances permit (my calling is rather an unsettled one—I am a soldier), but even we soldiers, you must know, sir, have a taste for the beautiful, at least, some of us, although we have been, at times, known to damage and totally destroy, in the most merciless manner, the figure after the Creator's own image.

Perhaps, Mr. Editor, the following extract from a letter I received some time back from a comrade in India may not be out of place in your columns, as it has reference to an instance of photography there; this letter was written in August last. The writer, after entering into some interesting details about the affairs in India, goes on to say:—"By-the-bye, Bob, you are a photographer—you will be interested to know that I was photographed out here the other day; I made one of a group of four, but I was quite ignorant of the matter until it was done.

"I was on out-post duty. I saw two of the native vagabonds dragging along a European woman, evidently against her will. I allowed them to pass, jumped out from my hiding place, took my rifle by the muzzle, hurled the butt end over my head, and, with a desperately-dealt blow, I levelled both the Indians with the ground; the poor woman fell with fright; she was not hurt, the firelock passing over her head (I was afraid to fire, because I could not shoot both the villains without hitting the woman), but she almost instantly regained her native courage. I was about to raise her, when she sprung suddenly up, and, pointing with her finger towards one of the ruffians, she reminded me where my attention should have been first directed. One of the villains had risen on one knee, and was grappling for the hilt of his sabre; I plunged my bayonet through his breast; he made a desperate leap, and fell to rise no more. I was in the act of turning to look to the other fellow, when I heard a wild shriek (a shriek of revenge), and saw something glisten in the woman's hand; in an instant the sabre of the other man had sunk deep in his own breast, when, with a hideous groan, he gave up the ghost.

"I was leading this heroic woman from the scene of slaughter, when a singular apparition stood in front of us,—this was a little, short, elderly man, dressed in white canvas; by him stood an object dressed in black,—this was a camera. 'You look surprised, young man,' said he, addressing me; 'I was on my way to take a view of yon old tree stump, under cover of which I saved my life the other day; but seeing you and this good lady contemplating the mortal remains of these two Indians, who, I suppose, have met with a deserving fate at the hands of some of our brave soldiers'—(I related to him what had happened; the old man congratulated the woman on her escape, and went on to say):—'Seeing you looking on these dead men, wondering (as I supposed) how, and by whom, they had been brought to that pass, I thought it was an interesting group, though not one of the pleasantest; so, accordingly I pitched my camera, and directed it upon you, and made use of the material I had in readiness for my friend the old tree.'

"This photographer was armed with a long sword, a six-barrelled revolver, and a sharp-pointed knife about ten inches long. I gave him my name; he called on me the next day, and produced a view of the scene I have attempted to describe to you, viz., myself, the woman, and the two dead Indians, with the most astonishing fidelity.

"Yes, Bob, I can assure you that the camera does its share in recording the deeds of our brave countrymen here, ay, even in the battle-field."

I see an account of a singular phenomenon said to have taken place in France—that of the man's face being seen on the pane of glass, or, rather, the shadow of his face, after his

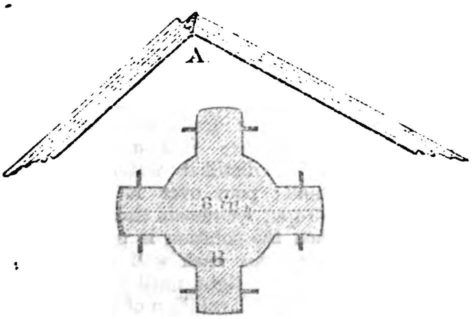
decease. A similar circumstance I witnessed a few years back, when stationed at Hythe, in Kent. A comrade of mine had paid a visit to Lympne castle, or rather the remains of it; there he picked up a piece of porcelain, on which were plainly to be seen the most perfect details of this old antique building; the walls and the ivy, &c., surrounding them, being in their true colours, though rather faint. I took this beautiful piece of nature's own painting in charge, being convinced that it was such, as these details never could have been traced by the hand of mortal. At the end of the first day there was no visible difference in its appearance, but at the end of the second day it became much fainter, and at the end of the third day it had nearly disappeared, and, finally, on the fourth day it was quite gone.

This, Mr. Editor, is a phenomenon that deserves the fullest investigation. R. W.

Croydon.

PORTABLE TENT.

SIR,—Persuaded that the uncertainty existing in all the dry processes as to the ultimate value of the embryo picture, would alone prevent them from becoming more than *derniers ressorts* of invalid amateurs, or from the encumbrance of unwieldy apparatus, I have ventured to encroach upon your space with the description of a tent of my own construction, possessing some advantages, be it said with due deference, beyond those already noticed in your columns.



Each of four triangularly-planed deal rods, 7 feet in length, and $1\frac{1}{2} \times 1$ inch diameter, is divided in half, and at the division a hinge screwed as at A. Then from one extremity of each of the jointed limbs, saw a cut to within 8 or 10 inches of the hinge. This will allow it to expand, and clasp, within transverse holes at the top, the iron studs fixed in the tent-top (shown at B). It will now be perceived that, by the removal of the lateral elastic pressure from the projection, the central piece may be removed with facility, and the legs folded and packed with those of the tripod. At the lower extremity of each support I have introduced a 3-inch earth-spike; but its insertion is rarely required, except in such boisterous weather as would be incompatible with landscape photography; and this addition may be dispensed with. The tent-cloth may then be wrapped around all, and secured by a leathern strap. In this state it is very portable. The cloth (black and yellow calico in my own) is sewn together in vandykes, one of which serves as an entrance, and is kept in tension by a slight weight, for the exclusion of light. The number of yards necessary may be easily calculated, as the surface of a cone, whose base is 6, and side 7 feet.

This construction of tent precludes the necessity of pins, fastenings, and central pole, inconvenient adjuncts to the one at p. 69; and combines facility of erection with unusual rigidity. Its size enables the operator to manipulate the largest plates with ease, or to shelter himself and apparatus securely from a summer shower.

Surmounted by a wooden acorn or *fleur de lis*, its appearance is far less objectionable to the artistic eye than the black canisters, or Brobdignagian kettle-drums, otherwise yclept tents.

Trusting these hints may be useful to numerous tent seekers, believe me to be, sir, yours very truly,

Shapscombe. EUPHOS.

THE PHOTOGRAPHIC SOCIETY.

SIR,—Allow me to point out an error which you have made in the admirable and succinct account which you gave in your ninth number, vol. i. p. 101, of the Proceedings of the Photographic Society. It is, however, one which I myself laboured under, until I was informed of it by a gentleman who had obtained correct information.

You proceed to notice a specimen of Compositive Photography, which, in a steady and consistent manner, you seem to think "scarcely applicable to photography," and which has earned for yourself and others the title of "ill-tempered art critics." The specimen was one by Mr. H. Robinson, of whom you have frequently spoken fairly and impartially, and whom, by the way, you again notice favourably in that article. The photograph which you have condemned was a damaged picture, exhibited for the purpose of showing the importance of early fixing after printing. The peculiarity to notice was, that the impressions first printed upon the sheet, and which were, consequently, kept the longest before fixing, were decidedly inferior in vigour and brilliancy to those last executed upon the same sheet. Hoping that you will insert the above, I am, sir, yours obediently, C. T.

[We regret that, owing to press of matter, we were unable to insert the correction which our correspondent has so kindly pointed out. The notice which we wrote on the occasion was necessarily hurried, as it had to be written a few hours before going to press. We, however, take this opportunity of observing that, under the circumstances, we were quite justified in making the remarks we did make. For all that we knew, it was a "simple first attempt of a novice in this art." If gentlemen send photographs illustrative of any point in photography to be inspected at the Society's rooms during the monthly meetings, they ought to accompany such pictures with description. Or, if they do not, it is at least the duty of the Secretary to see that the matter is attended to. There were many present, besides ourselves, who were puzzled at the picture, and who were at a loss to conceive the object of its exhibition. Under these circumstances, the remarks which we made were perfectly justifiable.—ED.]

Photographic Societies.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE first meeting of the season of this Society was held on the 9th inst., in George-street Hall; Mr. SCOTT ELLIOTT, of Arkleton, in the chair. There was a pretty numerous attendance. The chairman intimated that they had secured a room at Mr. D. Hay's establishment, where their annual Exhibition would open in the beginning of December, and they hoped to get sufficient subjects to fill the room. He then adverted to the loss the Society had sustained, since its last meeting, in the death of M. Ivan Szabo, and he suggested that the meeting should record on the minutes its deep regret at the occurrence, which had severed from them a most distinguished member. The secretary then read a letter showing that a large number of negatives and positives (the property of M. Szabo) were still on hand, and that the deceased gentleman's executors desired to dispose of them. The secretary also stated that an opportunity offered itself for any members of the Society subscribing towards a fund for the erection of a monument to M. Szabo's memory which had been projected. Mr. Kinnear then exhibited some specimens of a new process of printing discovered by Mr. Pouncey, which was said to be perfectly permanent. He also showed some new stereograms from prints by Mr. Sang. Mr. Colin Sinclair had sent some new pictures, which had a peculiar effect in the stereoscope, and these he would hand round for the inspection of

the members. Mr. Moffat exhibited a photograph from a large drawing done by the usual process of lithography, upon a principle which at present was a secret. It was taken from an "auditory print," but the process was not that of cutting out the various figures and placing them in proper positions, but it was completed on some scientific principle, which he was not at liberty to explain. Mr. Moffat then exhibited a specimen of an Improved Stereoscopic Cabinet, which contained fifty slides; and by movement of a lever the slides one after the other were rapidly presented in the stereoscope. No less than 150 slides could be placed in the cabinet, which had several drawers to hold them. The cabinet was inspected by the members, who praised the ingenuity of the inventor. There were no other subjects of interest before the Society.

Paisley Photographic Society.

The monthly meeting of this Society was held in the School of Design, on Thursday evening, 28th ultimo; the vice-president, Archibald Barr, Esq., in the chair. A paper was read by William Stewart, Esq., School of Design, on "The Artistic Qualities of Photographs." In demonstrating the qualities of a good picture, Mr. Stewart showed how defective in some of these qualities a photograph must necessarily be. Photography is a purely mechanical art. The photographer must take nature as he finds it. He has not always the power of choosing the best point of view, nor can he increase the artistic effect by altering the arrangement of objects in a landscape, or by introducing fresh objects. The art is, therefore, better adapted for copying than composing. Much may be done by a judicious selection of subject, and the choice of the best possible point of view. Transcripts of near objects, such as rocks, stumps of trees, or architectural subjects, are admirably adapted for the camera, and it is here photography must find its legitimate field. The sharpness of the tracery in a Gothic window, or of the detail in a mass of rock, or the bark of an old tree, excites our wonder and delight. In a photograph, on the other hand, embracing near and distant objects, it is difficult, if not impossible, to preserve the necessary harmony. If the foreground be distinct, the distance will probably be lost; while again, if the distance be preserved, near objects will be a dark and unsightly mass. The want of sky in most photographs is also a very serious defect. The following rules of composition, which should be observed in taking photographs, were given:—(1.) A picture should contain variety of form, and broken line, as opposed to uniformity of shape, and continuity of line. (2.) There should be an object or group of objects as a principal mass, to which all others should be subordinate; it should not be in the centre of the picture, nor isolated, or unsupported by others. (3.) Lines should not join, so as to form a continuous vertical or horizontal line. (4.) The foreground should be proportioned, and broken by diagonal lines. The force of Mr. Stewart's remarks was well illustrated by numerous examples, and several photographs by the members were submitted to a searching criticism. A hearty vote of thanks was awarded Mr. Stewart for his interesting and instructive paper.

Photographic Notes and Queries.

TO CONVERT POSITIVES INTO NEGATIVES.—DRY COLLODION PROCESS.

Dear Sir,—Many people seem very glad that you are come before them again in the form of editor of the "Photographic News," a paper, by-the-bye, much wanted, especially in its chemistry, dictionary, and its catechism, which is the very thing to enlighten the ignorance of us photographers, who pour on the collodion, immerse, expose, and develop, &c., because we are told to do so in some cheap work that has fallen into our hands, and not possessing the slightest information as to how or why the beautiful results follow the simple application of the several liquids. So, as many persons are glad at your reappearance, so am I, not because it is you, but because of the good paper you are editing, to which I wish every success; for I do not know you, unless you are the latter of "Messrs. Spiller and Crookes' nitrate of magnesia process,"* which is a process I have done some nice things with, although, at first, I did not care about trying it, as I had a great dislike to magnesia, never having seen it but in one form, when a small boy—nasty dry stuff they called carbonate of magnesia, and compelled me take at certain periods, like the brimstone and treacle days of Dickens' school in Yorkshire. But perhaps you may want to know who I am. Well, I will tell you. I am a native of Exeter, consequently a "Devonshire dumpling." Don't imagine that I am a short-necked creature, warranted to go off at a moment's notice, like the stopper of a collodion bottle in the sun; no such thing. I am slight and ill-formed, very much like a dry bean pod—crooked and bent, and far from being dumpling-like. I still am, and ever have been, very restless—always where I was not wanted; something like what many photographers have found the films of collodion to be when practising the "dry processes"—everywhere but in the right place. Now I can photograph a little, and have been able to do so for some years. I commenced when very small. My first attempt was after seeing my sister use some nitrate of silver to mark linen with; so having watched where she placed the bottle, I daubed my apron with it, and stood in the sunshine watching it gradually becoming darker and still darker; *in* doing which I received great pleasure—but *for* doing which a great reward, for father used active means in the bestowing of it. Then I had a camera obscura, and some bi-chromate of potash. Oh! how I watched to see the form of some house the other side of the street on my paper, after several hours' exposure, and how happy I felt if a faint trace remained after washing: and so I have gone on; and now I wish to give you a few words on two things much wanted. The first, how to convert a positive into a negative, and the second about dry collodion, both of which I can answer for. The inclosed impressions will give you some idea of the results of each.

1. *To Convert a Positive into a Negative.*—First moisten the plate with distilled water; then set the plate on a level stand; pour over it water, 1 ounce, tincture of iodine, 10 drops; let remain three to five minutes, until the positive, when the solution is poured off, is of a greenish-yellow colour; then wash well with rain-water; pour off and on, in bright sunlight, until sufficiently intense, a mixture of 1 ounce saturated solution of gallic acid and 15 drops of a 30-grain solution of nitrate of silver; then well wash, dry gradually, and varnish. I have tried all the thickening processes that have been published, but none are equal to the above for certainty of results. It is needless to mention that great care is requisite in washing.

2. *Dry Collodion.*—Much has been, and is being said, about Fothergill's process. Now, it appears to me, that it is a step in the wrong direction, inasmuch as it is very slow. What we want is, rapidity of action. We want to be able to introduce figures into our landscapes; for a figure or two, well placed, will make many an otherwise uninteresting subject, a gem. I have taken some with a ½-inch diaphragm and 4½ inch focus lens on a plate, 36 hours after preparation in sunlight, in 35 seconds. The one marked No. 1 was taken in 45 seconds. In the left corner of the left-hand picture you will perceive the figure of a boy who was there, and I did not observe him at the time. It will give you some idea of its rapidity. No. 2 is the same length of exposure. In the right-hand picture you will perceive, on the ground, indistinct patches: it is the result of persons passing slowly or standing in the way. No. 3 is a thickened positive of Lynmouth. The following is the plan I have pursued for three years past. First, to make collodion fit for it, take—

Ether	5 drachms.
Alcohol	3 do.
Pyroxyline	5 grains.
Iodide of ammonium	5 do.
Bromide do.	1 do.

Let them remain for 24 hours after mixing. Pour off the

* Quite correct.—Ed.

clear portion; add, whilst warm, a quarter to half an ounce of common table salt well dried in the oven; shake it occasionally for two or three days. The object of the salt is, to absorb as much water as possible, as it is a far better plan than re-distilling alcohol from potash. When clear it is fit for use, although it improves by keeping. Sensitise as usual. On removing from the bath, well wash, as on this depends the keeping quality. I shall not say more on the advantage of well washing, as so many have shown its necessity. Place on a pad of blotting paper, inclined against the dark box, film side towards the place it rests against. They take 12 to 20 hours drying; expose and develop with saturated solution of gallic acid. I have kept then eight or ten days. ONE OF DEVON.

SPIRIT VARNISH TO BE APPLIED WITHOUT HEAT.—FORMULA WANTED.

SIR,—I have looked anxiously over each number of the "NEWS" in the hope of finding a recipe for making a spirit varnish that could be used without heating the plate, but in vain.

During the summer, and often at other times, I find great difficulty in obtaining heat of fire for varnish; and I therefore think, that could a spirit varnish be made that could be used cold, and would dry rapidly, *transparent* and hard, a boon would be conferred, especially on amateurs. I have experimented in this direction a good deal. If you pour spirit varnish on a collodion plate without heating it sufficiently, it dries a dense white opaque colour, totally unfitted for negatives. True, you can get a very excellent varnish which can be used cold, dries clear and hard, and very rapidly—benzol and gum dammar; but for positives it possesses a grave defect, inasmuch as the solvent of much of our black varnishes is turpentine or naphtha—which reacts upon the benzol, and the whites consequently suffer.

Again, I have prepared chloroform varnish, which can be used without heat, dries rapidly, hard, and clear; but although methylated chloroform can be got for 2s. 6d. per lb., it is only the one half in bulk compared with methylated spirits.

Now, sir, having hurriedly given you some of my crude trials after perfection, may I fondly hope that some of your able correspondents, failing yourself, will be able, in an early number of the "NEWS," to furnish a recipe for a spirit varnish possessing the requisites I have mentioned?

LUCIUS VERITATUS.

[Several excellent recipes for spirit varnishes have already appeared in our columns. We are afraid that the problem of which our correspondent requires the solution is not a very easy one; but as the information would be of great value, and possibly some of our correspondents may be clever in such matters, we have inserted the above request.]

CONSEQUENCES OF APPLYING HEAT TO THE SILVER BATH.

SIR,—Your correspondent, "J. W. Whelan," at vol. i. p. 106, has given, as I believe, correctly, the first part, but the first part only, of the answer to your question, as to the wavy, muddy-like lines, occurring occasionally on a collodion plate. He suggests that the ether accumulated in the bath from many plate-dippings is the cause, and that the ether may be removed by applying gentle heat to the argentine solution.

This is good so far as it goes, but, in my practice I have not found it to go very far; or, in other words, I could never make many good pictures with a bath after it had been so corrected. Why? For a long time I did not know. For although the acid reaction was renewed exactly as before, and the overdosing of the bath with iodide, by the frequent plate-dipping, was also corrected (by adding distilled water, filtering, and then giving more nitrate of silver), still the bath, or rather the collodion plates dipped in it, was slow as well as bad in action.

What was the reason of this? Looking at the bath formula, that immediately suggested that some of the *alcohol* must have evaporated, together with the ether, when the heat was applied to expel the latter. Alcohol was accordingly added, and at once and immediately the action of the bath immensely improved.

But, as to *how much* alcohol ought to be added after each successive re-heating of a bath in frequent use,—I cannot give good advice.

My best thanks to "S. M." and yourself for hints on "Fogging," at vol. i. p. 95.

Edinburgh, November 12, 1858. C. P. S.

EMPLOYMENT OF A CAMERA AS A MAGIC LANTERN.

SIR,—There is a letter in your last number on the employment of the camera as a magic lantern. Your correspondent has failed, it appears, to obtain satisfactory results, though he closely followed your directions given in a preceding number. The cause of his failure, as you state, is undoubtedly *want of light.* If, in addition to the "bull's eye" and "concave" reflector, your correspondent were to use, not a common argand lamp, but an argand having a *jet of oxygen* gas passing through its centre, and a small *ball of lime* suspended in the flame, I undertake to say that he would, in more senses than one, achieve a *brilliant success.*

I am but partially acquainted with the *practical details* necessary in employing the above mode of lighting a magic lantern; and my object in addressing you is to solicit the instruction I am in want of. It would be a gratification if you, or some of your correspondents, would give an article on the subject; and, as the winter evenings are now with us, if you would do so without delay.

As to the *expense* which such a lamp involves, it is, I believe, but slightly greater than that connected with an ordinary lamp; and even if otherwise, three or four photographers in a locality might unite. S. E.

GLASS POSITIVES IN LOCKETS.

SIR,—Your correspondent, J. F. M., at vol. i. p. 107, puts E. M. and others up to a means of overcoming the difficulty of cutting glass for lockets without injuring the pictures; but, at the same time he necessitates another difficulty, viz., guessing the focus; but this can easily be remedied. Take a piece of glass, of the same thickness as that cut for the locket (or a trifle thicker, to allow for the gutta percha cement), the size of the holder, and cut a square piece out of the centre large enough to admit of the glass cut for the picture; place this in the carrier in front of the glass holding the prepared piece, and, as a matter of course, it will be in the right focus. R. W.

Croydon.

NON-REVERSED GLASS POSITIVES.

SIR,—Take a plate of glass, the size of the plate you are going to use, and cement a small piece of glass upon each corner. Then put the sensitive plate, collodion side uppermost, into the dark slide; place the plate with the pieces of glass on the corners upon it; put down the shutter, and proceed as usual. In focussing, allow for the thickness of the glass plate. J. S.

ANSWERS TO MINOR QUERIES.

TONING GLASS TRANSPARENCIES.—*H. S. N.* objects to the colour which glass transparencies usually have when printed by the collodio-albumen or Fothergill's process, and wishes to know how the colour can be improved. Make a solution containing a few grains of sulphide of potassium, or a few drops of sulphide of ammonium to the ounce of water; pour this on and off the wet plate (just after fixing and washing), and the tint will quickly change to a rich dark colour. The operation should be

performed in a good light, and with a plentiful supply of water close at hand, so that the excess of sulphide may be washed off as soon as the desired tint is reached. After washing, dry the plate as usual.

Micro-photography.—*Rostha* inquires how the small photographs are produced which appear but a spot to the naked eye, but, when viewed through a microscope, are seen to be perfect pictures. The chief requisites for the production of this kind of picture are, a good compound microscope, and a collodion giving a perfectly structureless film under a high magnifying power. Incline the body of the microscope until it points horizontally, and place it at one end of a stout, firm table, the object-glass pointing outwards; remove the eye-piece, and allow the open tube of the microscope to point along the table. Exactly opposite, and about 3 or 4 feet off, arrange the negative on a frame, so that its centre shall be in a line with the axis of the instrument. Remove the stage, and, in its stead, arrange a frame of wood, with silver or glass corners for holding the focussing glass, or collodion plate, so that, by means of a spring, the ground surface of the focussing glass, and the sensitive surface of the glass plate, will always be pushed up to the same plane. Place a powerful lamp at a little distance behind the negative, and arrange a bull's-eye condenser so that a uniform brilliant light is thrown on the negative. This is best managed by placing a sheet of paper temporarily in place of the negative, and adjusting the relative distances of lamp and condenser until the paper is uniformly illuminated to the required size; then insert the negative, and having screwed an inch object-glass on to the instrument, move it to and fro by means of the coarse adjustment until an extremely diminutive image of the negative is apparent sharply defined on the focussing glass. The focussing should be performed with a magnifying glass, and when the best *optical* focus is obtained the real chemical focus should be arrived at by increasing the distance between the sensitive surface and the object-glass, by means of the fine adjustment, and taking several pictures at different distances until the position is ascertained, which yields the sharpest results; that position once ascertained, a mark should be made so that the exact spot can be at once ascertained. It must be remembered that the above alterations are for distances not exceeding a few thousandths of an inch, so the greatest care will be required not to overshoot the mark. The position of the large negatives must not be altered, as the adjustment of the focus would thereby be deranged; but, of course, any other negatives can be substituted, provided they are placed at exactly the same distance from the instrument. The best glasses whereon to take the pictures are those which are prepared for microscopic slides, made of the best thin plate with their edges ground smooth. Some discs of thin microscopic glass should also be procured for the purpose of being cemented with Canada balsam over the finished picture in order to preserve it. The great difficulty in these operations is the collodion: it should be rather thin and feebly iodised, and, of course, perfectly structureless; and any of our correspondents who can instruct us in the way of preparing a collodion which will admit of the image being examined with a compound microscope without showing a granular appearance or reticulation, will confer a boon, not only on us, but on all persons engaged in the art. The other baths and solutions may be the same as in the ordinary negative process.

Encaustic for Positive Prints.—*S. W.* wishes to know if a slight gloss and vigour can be given to positives on unalbumenised paper by any after-treatment. *S. W.* objects, however, to that glazed with albumen as being *vulgar*. We have employed the following plan with advantage when mounting prints on plain paper:—Make a mixture of 1 ounce of white wax and 6 ounces of Venice turpentine; add to this sufficient spirits of turpentine to bring it to the consistency of cream. Mount the proofs on a piece of card, and when quite dry rub the above mixture over the surface with a piece of flannel; the pictures will be seen to be much improved, and the shadows will appear more vigorous, whilst a softer tone will be communicated to the whole picture.

Printing from a Cracked Negative.—*F. Williams* has a valuable negative which, owing to its having been screwed too tight in the pressure frame, has a crack running about half way across the figure. On printing from this the *crack* is reproduced, with exaggerated distinctness, as a broad, white line edged with black. This evil can be remedied in great measure by placing a sheet of fine white paper outside the pressure frame close to the glass. The diffusion which this causes to the light prevents a shadow being thrown from the crack in the negative on to the prepared paper.

To Keep Positive Developing Solution.—*J. S.* The positive developing solution, for which the formula was given at vol. i. p. 12, will keep good for six months, or more, if the stock bottle is not opened more than once or twice a week. The bottle should be kept well closed and turned upside down, resting on the cork so that no air can get in.

Copying Camera.—*A Subscriber.* The dimensions of a copying camera entirely depend upon the focal length of the lens you wish to employ; that being known, a few experiments, aided by a geometrical diagram, will at once give you the information wanted. If you use a portrait lens the front of it should be turned *towards* the negative, if it is to be reduced; but *away* from it if it is to be magnified. The distance between the lens and the picture to be copied, or between the lens and focussing glass, may vary from the focal length of the lens to infinity, according to the size of the reproduction required: the nearer the lens is to *one* the further must the *other* be removed.

TO CORRESPONDENTS.

*** *Lessons on Colouring Photographic Pictures will be commenced in an early number. They will include Powder, Water, and Oil Colours, together with a few hints on the Harmony of Colours, and will form a complete and practical treatise on this important branch of the art.*

W. D. B.—Your fault is over exposure. We have seen some tolerably good prints by Mr. McCraw's process, as mentioned in our last number.

Darkie.—We cannot answer such questions. Send us a full statement of your difficulties, and we will help you; but we cannot undertake to find your difficulties out for you.

B. Positive.—Your bath was not made with good chemicals. Your best plan will be to reduce the silver from it, and make another bath. An *achromatic* meniscus lens is the most proper kind for landscape purposes. 4. No. 5. The developing solution is wrong. 6. Sitter to face the north.

Paul Pry.—1. One to five guineas per pair, *if good.* 2. They would be admitted, if worthy of a place, even though you are not a member. 3. We fancy the collodion is in fault. Try another sample, and, if that acts the same, make a fresh bath. 4. It need not be re-iodised, but will not be quite so sensitive as at first; it will, however, do well for out-door work. We shall be very pleased to see your pictures.

J. S.—We have not been very successful with the varnish described by Nil. Sil., p. 71, but have obtained better results by following the plan recommended by Sphynx, at p. 106. We wish we could inform our correspondent how the excellent and durable varnish made by Soehnée Frères is prepared.

R. W., Croydon.—Either the silver bath is too acid, or the collodion is made with bad pyroxyline.

E. S. H.—The experiments you wish us to undertake respecting the samples of paper, would occupy far too much of our time for us to spare, if the information is intended only for our correspondent's benefit.

A Kentish Man.—1. Try the process in vol. i. p. 86. 2. The exciting bath for positive albumenised paper always gets discoloured; it may be used until almost as dark as port wine, then decolorise it by shaking up with pure kaolin. 4. Face downwards. 5. Use glacial. Beaufoy's is less pure, is of uncertain strength, and costs almost as much.

Disk.—1. The collodion is not iodised sufficiently; the bath is all right. 2. See vol. i. p. 87.

Sphynx.—It would be invidious on our part to recommend any particular collodion. Try the new collodion advertised in this number.

Raven.—The book is not yet written that we could conscientiously place into a beginner's hands, as containing all the information, and no more, necessary to make him a good photographer. We quite agree with you that, were it possible to have the "Photographic News" to the year 1860 *at once* on our tables, we should want no other book on photography. Is it not worth while to wait a year or two for such a glorious consummation?

T. T.—*We* are the best judges of how much information it is advisable to place in the student's hands each week.

J. D. Watchett.—Send an address, and we will communicate with you.

G. A. H.—We have heard of such a result after using very impure nitrate of silver in the bath; but the true cause is not known. Make a fresh bath with pure nitrate.

Chemicus.—The proposed alteration will make a very good glass room.

J. S.—Use a copying camera.

W. H. W.—We shall be very pleased to see you. Has your bath too much alcohol in it? that is the only suggestion we can offer.

Volo Noscere.—Send an address, and we will communicate with you.

Communications declined with thanks:—Lens.—B. P.—J. K.—A Painter.—X. Y. Z.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—S. D.—Regular Subscriber.—F. T. S. H.—In a Fix.—Tycho.—A. C.—L. M.—A Correspondent.—Subscriber.—W. A. F.—Stereo.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

Vol. I., No. 12.—*November* 26, 1858.

We feel it due to the character of this Journal, as well as to those gentlemen who honour us with their support, to offer some remarks on an article which appeared in the last number of *the soi-disant* official organ of the Photographic Society; an article not less remarkable for its style—or rather for its want of style, and the absence of logical reasoning—than for the unfounded insinuations which it contains. We do not complain of it on the score of the literary ability—or, perhaps it would be more correct to say, on the want of it—displayed in its composition, nor of its illogical reasoning. That is an affair with which we have no concern. We have only to deal with the insinuations it has levelled against us. The article in question states "that members complain that notes of their communications, more or less inexact, are taken without their consent, and printed without their revision." To the first part of this charge we reply by a flat contradiction. Our own reporter was present; and we can assert, from our own knowledge, that the report was substantially a fair and correct report. In further proof of this, we may add that not a single complaint has reached us from any gentleman who was present at the meeting. Moreover, we have another proof to offer that the latter part of the charge is, equally with the former, as unfounded as it is malicious.

At the meeting in question, the only paper read was that by Mr. Traer, on "The Photographic Delineation of Microscopic Objects"; and, at the conclusion of the meeting, our reporter waited on Mr. Traer, and requested him to allow him to copy his paper—a request with which Mr. Traer, with the courtesy of a gentleman and the liberality which usually characterises scientific men, complied. The report, therefore, which we published was a literal transcript of that paper. So much for this part of the article!

The most extraordinary part, however, of this very extraordinary production, which the Council has thought fit to publish, is the assertion that they are "eager for publicity;" and in the same breath the declaration that "the Society is its own reporter"—a declaration which, if it means anything at all, means that it alone has the right to publish reports of its proceedings. It is impossible to reconcile these two statements. If the Council is really desirous that the greatest amount of publicity should be obtained for its proceedings, why does it complain because "The Photographic News" anticipated the report in its own organ? Surely, if anything is said at these meetings with which it is desirable that photographers should be made acquainted, this object is better attained by its publication in a Journal which is read throughout the length and breadth of the land, than by its being confined to the pages of one that is little more than an organ for a *very select* circle of readers! Does the Council imagine that the circulation of "The Photographic News" is as limited as that of its own special organ? If it does, it will be somewhat surprised to learn that "The Photographic News" numbers its readers by tens of thousands—a piece of information with which, considering its eager desire for publicity, the Council will, no doubt, be exceedingly gratified.

We have no hesitation in asserting that the desire expressed by the Council that the greatest publicity should be given to the discussions at the meetings of the Society is a mere pretence, their real desire being to impede the increasing circulation of this Journal—a task which it is as far beyond their power to accomplish as we believe it to be distant from the wishes of the majority of the members of the Society. Indeed, it would be absurd to suppose that the members of the Society could have any other feeling than satisfaction at seeing their remarks published in a paper which circulates not only in England, in India, and in every English colony, but also over the greater part of the continent, where it is quoted as an authority on photographic matters—a circumstance which, however flattering, we should scarcely have thought of mentioning, but for the unwarrantable attack which has been made upon us.

Again, we may well ask, what interest can we be supposed to have in the publication of these reports, beyond the desire to be of service to the members of the Society? It is certainly not from any expectation that we shall thereby increase the circulation of this Journal that we give them publicity; and, so far as advantage to ourselves is concerned, we might well be content to leave them entombed in the pages of that journal, which depends for its continued existence on its being the chosen receptacle for all the desultory conversation indulged in by a few garrulous members at their meetings. We trust that our real motive is obvious to every impartial and honest man. It is simply the anxiety we feel that every photographer, who has devoted months or years of labour to the study of some particular subject connected with Photography, should receive, in the increased respect and esteem of his brethren in the art, the reward due to his exertions. Take the case of the gentleman whose paper has given rise to this ebullition of wrath on the part of the Council. He has spent a long time in the study of the best method of reproducing *microscopic objects* by means of Photography. He devoted some time to the preparation of the paper; and then took the additional trouble to read it—and to what end? Where would have been his reward if the paper had been buried in the columns of a journal which not one in five of those who receive it ever reads; whereas it has now been read in every nook and corner of England, and wherever the English language is understood?

We have now done with the matter as far as we alone are concerned, but we have still to advert to a "resolution" to which the article we have animadverted upon may be considered the preamble; it runs thus—"Complaints having been made that the papers communicated to the Society appear in other journals" (this is untrue, as regards the question at issue; the paper appeared in the "Photographic News" alone) "before their publication in the Society's journal, it is re-

solved, that the secretary be directed to request the proprietors to desist from such publication."

It might be inferred from this, that the Society is a private one, and that the speeches delivered at their meeting should be as sacred from publication as though they were uttered in one's own house. Now the Council expressly states that the Society is a *public* body; and at the same time it announces its determination to take legal proceedings to prevent the publication of the communications referred to in the resolution. Such a threat is, of course a mere *brutum fulmen*. Without stopping to discuss here the legal bearings of the case, which will have proper attention at the proper time, we may merely state that we presume that the meeting of a public body must, necessarily, be a public meeting; and as such we have a perfect right to report its proceedings in as full and complete a manner as we think they deserve. As, however, we have not yet received the request with which, in accordance with this remarkable resolution, we were to have been favoured, we can only conclude that discretion may have suggested itself as the better part of valour.

We regret that the names of the members of the Council, whose united wisdom led them to the enunciation of the above dignified resolution, are not appended to it. We are thoroughly convinced that its members generally, with one or two notorious exceptions, would have resisted, had they been present, such a paltry and futile attempt to injure this Journal.

In conclusion, we may assure those members of the Photographic Society who honour us with their support, that we shall not be deterred by threats from giving immediate reports of proceedings that may take place at the Society's meetings, and which we may deem of sufficient importance to entitle them to a place in the columns of the "Photographic News."

PRINTING IN CARBON.

The French Photographic Society will have no easy task to perform, when the day arrives, for awarding the prize offered by the Duke de Luynes for the discovery of a method of printing photographs in carbon. It is at present impossible to form any idea of what will be the number of claimants for this prize; but we do not see why they should not be so numerous that, if they felt disposed for a trip to Paris in the pleasant month of June, they might make it profitable for the "Great Eastern"—or "Leviathan"—which is it? to take them to Boulogne altogether, and wait to bring them back again. It would be strange indeed if, considering all that has been written on the subject, any photographer, possessing even a slight knowledge of chemistry, could not hit upon some plan of printing photographs which should be more or less a carbon process. We are ourselves but young, though, of so goodly a growth, that we might well be esteemed the senior of our contemporaries—and therefore have had but little to say on the subject. We will now, however, give a brief analysis of what has been written on the carbon process; and if, with the aid of these observations, and what we have written previously, our readers cannot discover how to apply it, we imagine it will be their own fault.

For very many years past photographers have been aware, that a mixture of bichromate of potassa and gelatine is sensitive to light, and this knowledge has been rendered available in most of the processes of photo-lithography; and, as a natural consequence, this suggested the possibility of its being modified, so as to be made available in the printing of positives; hence, finely divided carbon was mixed with the bichromate of potassa and gelatine, and not only carbon but various other pigments have been tried, with results which may be best described as more or less unsatisfactory. Still they were pictures, even if they were not very good ones; and we entertain very little doubt that any photographer, who has time at his disposal for experiments, might improve the process so far as to make it useful.

There is at the present moment a subscription open to purchase the process of carbon printing, the secret of which belongs to Mr. Pouncy. This gentleman announced his discovery in a letter to a contemporary on the fifth of March last. The enthusiastic manner in which his communication was received would have been laughable, but for the importance of the discovery to which it referred. It prophesied that, "the abominable process at present employed will be swept away, and superseded by another, which will satisfy both artist and chemist;" and then, as if conscious that this high-flown enthusiasm was rather ridiculous under the circumstances, it added—"Our readers may smile at these predictions, and think us rather too enthusiastic; but, if the truth must be told, we rather pride ourselves on the *practical* character of our suggestions, and assign three months as the probable date of the fulfilment of the predictions now committed to print." Our contemporary affords another instance of the danger, when prophesying, of committing one's self to figures. Since this daring prophecy was uttered nearly eight months have elapsed, and it has not yet been realised. We are, however, consoled with the assurance that we shall not wait for it much longer. Mr. Pouncy is described as a man who is now in a position to *give* the public the benefit of his discovery; but our contemporary was too energetic and philanthropic to suffer any such obstacle to shut out the public from the advantages opened up to it by this discovery: it therefore proposed to purchase Mr. Pouncy's secret, (which he offered to communicate for £50,) and to raise the means through a shilling subscription. Yet, so little did the mass of photographers appreciate the importance of the process (which was to save them we don't know how many pounds a year in nitrate of silver alone), that the subscription, after dragging along for months, only numbered 300 subscribers. At this stage of the affair, our contemporary entered into an agreement with Mr. Pouncy to make up the difference between the amount subscribed and the £50, and to trust to subsequent events for recovering the amount advanced. The manner in which it was proposed to communicate the process was by means of a pamphlet, which was to be forwarded to each subscriber, together with a license to print; but, at this critical moment, when our contemporary was placed in possession of the secret, he discovered, that it so closely resembled two processes for which letters patent had been taken out that it was unsafe to grant licenses. The process of Mr. Pouncy is thus described in the specification lodged by him:—

"This invention has for its object improvements in producing photographic pictures on paper and other surfaces. The surface has usually been prepared with substances which, when acted on by light in the process of producing the picture, are chemically acted on so as to produce (either immediately, or when other substances are applied afterwards to the surface) the colouring matter or substance in which the picture is formed. Now, according to my invention, I prepare the paper, or other surface, for having the picture produced on it, by applying over its whole surface the colouring matter which is to form the picture, and, together with this colouring matter, is applied a substance which is acted on by the light. The following is the manner in which I proceed when printing positive pictures on paper from negative pictures:—I coat the paper, or surface, which is to receive the picture, with a composition of vegetable carbon, gum-arabic, and bichromate of potash; and on to this prepared surface I place the negative picture, and expose it to the light in the usual way: afterwards, the surface is washed with water, which dissolves the composition at the parts on which the light has not acted, but fails to affect those parts of the surface on which the light has acted; consequently, on those parts of the surface, the colouring matter remains in the state in which it was applied, having experienced no chemical change. Sometimes, for the vegetable carbon, I substitute bitumen; or other colouring matter may be employed."

It is affirmed by our contemporary that this process is not precisely that which Mr. Pouncy proposes to sell; but,

if it is not, we imagine that the difference is immaterial. In fact, the position which Mr. Pouncy has assumed appears to us to be very similar to that of the horse-taming Mr. Rarey—he has first published his process, and then, without acknowledging this, he has asked the public to buy the "secret."

The two processes referred to above are those of M. de Beauregard and M. Poitevin. The process of the former consists in coating a sheet of paper with a saturated solution of bichromate of potash, in which a certain proportion of gelatine or gum-arabic has been dissolved, and, when dry, the gelatinous surface is rubbed with a colouring matter, such as blacklead. M. de Beauregard also claims an exclusive right to the employment of other methods of accomplishing similar results. With respect to Poitevin's process (not that we described in a previous number), the specification is so vague, that it may be precisely the same as M. Beauregard's.

Here the matter rested for some time—the next reference to the process being simply to inform us that Mr. Pouncy had not been idle—that he had greatly improved his process —but that he did not intend to publish it until after the prize offered by the Duke de Luynes had been awarded. A fortnight later we are rather abruptly informed that the subscription list is now open, but this time £100 is the sum required to purchase the secret; and, at the present moment, we believe that nearly the whole of that sum has been subscribed. Whether the subscribers will be found to pay up their subscriptions as readily as they promised them, is another matter. For our own part, we cannot help thinking, that if Mr. Pouncy's process is as good as it has been described, that he would have gained five times the sum above mentioned if he had published it first, and trusted to photographers to raise a subscription to repay him for his trouble afterwards. As it is, the begging letter style in which photographers have been worried for subscriptions, has excited doubt and mistrust as to the value of the discovery.

QUESTIONABLE SUBJECTS FOR PHOTOGRAPHY.

In a recent number of this journal we noticed a stereoscopic slide, published under the attractive title of the "Skeletons' Carouse," which was not only revolting as far as the desecration of human skeletons goes, but was positively disgusting as beheld in the stereoscope, which of course added much more to the ghastly effect of the whole picture. We have often pondered upon the subject of the present degraded state of stereoscopic illustration, and are again induced to revert to the subject, because we feel that not only do the cause of Photography and the claims of Art demand it, but, we are ashamed to add, decency calls for it. We observe with regret that there is every day a more perceptible tendency to debase that really useful and instructive instrument, the stereoscope, not only by the production of tasteless and insipid compositions, but of positively improper pictures; and from the increase and variety which almost daily present themselves in the shop windows of even respectable traders, it is evident that the demand for this sort of thing is on the increase. The enormous run which silly "Christenings," sentimental "Weddings," and namby-pamby "Broken Vows," have, is really astonishing. If the subject, however, be carefully studied, there will be found to be a reason for it all; and the one at which we have arrived is this, that the stereoscope is "the poor man's picture gallery," and that owing to the present comparative cheapness of the instrument, many who have indulged in the luxury have felt such a pleasure in beholding objects stand out in relief, that they have become enamoured of anything stereoscopic, and in their anxiety to procure something which should present the same novelty, they have not cared to be over particular in the selection of subjects; and as weddings and that class of composition have appealed to the sentimental feelings of the young-lady portion of the public, there has arisen a great demand for that class of picture.

The composers, having exhausted all their ingenuity in discovering new subjects of this class, at length turned their attention to the production of another class of picture. The specimens exhibited were at first so mild, that it would have appeared straightlaced to have objected to them; then by degrees they became more and more vitiated, and now they have arrived at a pitch of impropriety which calls for the interference of the police authorities. There is nothing so palpable in these slides as the fact that they, like the Pindaric razors, are made "to sell;" but there is this consolation, in addition to the almost certain fact that the demand must surely fall off, that the slides so printed will fade; so that what was once a stupid or improper picture will, in the course of time, become something infinitely better—a slide of white paper.

Although we may be called "ill-tempered," we nevertheless persist in the opinion that composition is scarcely applicable to photography. The perpetrators of these stereograms of course are opposed to this, inasmuch as stereographic composition enables them to produce pictures which stand out in relief; but in any case, no one will, we presume, deny that composition is the most difficult department of photography; and does it not therefore follow that it should only be practised by those who have a true artistic feeling? Now, it is not a little surprising that the leading compositive photographers—Rejlander, Robinson, and others—seldom attempt (as far as we know) the composition of a stereogram? *A fortiori*, then, is it not the height of absurdity for men who have not the least sentiment or poetry about them to attempt to illustrate either an incident or compose a picture? If these would-be artists wish to display their cleverness, why not turn their attention to the hundreds of other subjects which might be mechanically done, and leave that department, which is acknowledged by all to be the most difficult, for those who can do it?

Our more particular object in this article is to call upon all who deserve the name of photographers to take some means to put down the publication of improper pictures—that class which has earned for itself the title of "Holywell-street revived." Lord Campbell's famous Act had for its object the suppression of demoralising works and pictures, which were notoriously sold, more especially in the above-named street; but in the case of those lithographs which were a disgrace to human nature, there was at least the consolation of knowing that they had no existence except in the salacious imagination of some immoral draughtsman, who prostituted his talents to so vile and degrading a purpose; while in the slides we are alluding to we have the full assurance that a *woman* has been the model. One remarkable feature in the majority of this class of stereogram is, that they seldom or ever include any female who approaches in the remotest degree to a Venus; they are always characterised by more or less of a coarse ugliness, and certainly neither the demand nor the pecuniary value will be enhanced by admiration for the intrinsic beauty of the figures. The Saturday *Review* some time ago called attention to this subject in a very able article. Speaking of the effect of Lord Campbell's Act, it said:—"How far the filthy commerce which Lord Campbell proposed to check has been subverted we have no means of knowing; but we do know that exhibitions, which do not exactly fall within the scope of his bill, but which are perhaps better calculated to effect the infamous objects which it attempted to discourage than indecencies of a coarser description, are extremely common; and unless we are much mistaken, have recently increased to an enormous degree. There is hardly a street in London which does not contain shops in which photographs, and especially stereoscopic photographs, are exposed for sale, which are certainly not positively indecent, but which it is equally clear are expressly intended for the gratification of that pruriency which Parliament tried to deprive of its coarser stimulants." Our contemporary may not have seen exhibited photographs which were positively indecent, but we have seen some which ought at once to be consigned to the flames—there are many

such published. It goes on to say:—"We cannot, of course, enter into particulars upon such a subject; but if any of our readers will walk down the Strand, he will see numerous shop windows, in other particulars of the most respectable character, which are studded with stereoscopic slides, representing women more or less naked, and generally leering at the spectator with a conscious or elaborately unconscious impudence, the ugliness of which is its only redeeming feature. There is a brutal vulgarity and coarseness about some of these pictures which are as surprising as they are disgusting. We have seen publicly exposed, in a shop of decent appearance, a slide representing a woman in bed, with a man in his night-cap and night-shirt seated in a chair nursing a baby, and underneath written 'My Last Edition.' To call such things indecent is perhaps in some cases unjust; but even when they are not open to that imputation they show a stupid, coarse vulgarity of taste and sentiment which is a natural introduction to indecency of every kind. The more we think of the way in which such things are made, and in the use for which they are designed, the more apparent does their offensiveness become. Decency is a matter rather of sentiment than of fixed rule, and there would be far more indecency in sitting a single time for any one of many dozens of the photographs in the Strand than in adopting the profession of an artist's model."

As our weekly contemporary very properly remarks—"It must be remembered that a picture is always to some extent idealised. A Grace, a Nymph, or a Venus, is an unreal, conventional being, whom we associate only with picture galleries; but it is the very merit and object of these photographs to reproduce the real actual woman in the very attitude in which she agreed to pander to the vulgar tastes of mankind." We regret extremely that our space will not allow us to give in full the admirable article from which we have quoted; but as the Photographic News circulates amongst that class who produce these slides, we therefore call their attention to the question, and we think that they will at once see, unless their sense of decency is too far vitiated, that they are bringing upon our favourite art a scandal which it is highly desirable to have removed at once. To our mind there is something positively sacrilegious in the idea of prostituting the light of heaven to such debasing purposes.

To show that we are not taking too extreme a view of the case, and that what we have just said is not too strong, we cannot do better than extract the following lines from an article on the subject which appeared in the *Morning Post*:—"On behalf of public decency we implore the authorities whom it may concern to direct a scrutinizing eye at the windows of photographic salesmen. Holywell-street is fairly out-rivalled, and fast-going tobacconists are cast into the shade by the more outrageous displays of men who would sadly grumble if their pretensions to art and science were not allowed. It is needless to particularise—it might be imprudent to do so; but most observant wayfarers through London streets during the last few days must have seen in the windows of certain photographic shops, much to their disgust, outrages against common decency endeavoured to be palmed off under the specious pretence of their being works of art. We are not squeamish. Our principles are compatible with the fullest legitimate scope of the pictorial and sculptured art. We do not feel called upon to clamour for a general investure of such figures with togas and fig-leaves; we are not shocked at the sight of a Cupid without pantaloons—not hypercritically fastidious about the pose of a Venus or a Hercules; but to see a too life-like representation of courtezanship transferred in all its faithful hideousness to picture tablets by photo-actinism—a very microcosm of impurity—this is one of the things we cannot look upon without disgust. To our apprehension no sort of pictorial offence is so utterly bad and abominable as is perpetrated by these too faithfully-rendered stereoscopic pollutions. There can be no surer dictum of Art than that which insists upon the existence of traits and markings in nature unfit for literal rendering. The very essence of Art resides in the poetry of it, and without imagination there is an end of poetry. It should be enough, in respect to the photographic abominations of which we speak, to call them *abominable*. Unlike ordinary pictures, where models supply the mere ideals, the photographic slides are the *very* models. Every one of those startling poses had its representative in nature. Every trait of the original is there. Just fancy the organisation of vice which it implies—vice under the garb of Science and Art."

We have been betrayed into greater length than we had at first contemplated, but it is solely owing to our anxiety to see this scandal suppressed. The morning journal from which we have quoted the above calls upon the police for a "razzia" against the demoralising exhibition.

While on the subject of improper photographs, we may state that we were recently scandalised at seeing two or three very questionable photographs, but more especially one, exposed in a place where we should above all others least have expected it. It is a coarse, vulgar photograph of a nude female figure seated on a couch in anything but a graceful attitude—indeed the photograph is quite as bad, if not worse, than the majority of those which we have condemned above. We have felt it our duty to allude to this subject; and, "although it is not an agreeable theme to refer to, we would recommend to those gentlemen who do not wish to see the degradation of Photography, not to allow their own productions to be exhibited side by side of such degrading associations,"* and to use their influence in endeavouring to remove the disgusting photograph to which we have referred from the walls of the Photographic Society's rooms in Coventry-street.

GENERAL OBSERVATIONS ON PHOTOGRAPHIC POSITIVE PROOFS.

BY MM. DAVANNE AND A. GIRARD.

The well-demonstrated influence of abundant sizing in the preparation of positive proofs, might give us the reason for the general practice by photographers of laying on the paper, as prepared by the maker, of an additional layer of size, formed either of starch, gelatine, or albumen. Preceding researches have established that in gradually augmenting, up to a certain point, the number of the sizings, the proof acquired in the same proportion additional vigour and sharpness. But it is important to inquire if all amylaceous substances have the same value, and to institute a similar comparison between gelatinous and albuminous substances.

1. *Amylaceous Substances.*—Starch, when employed in the same proportion, under the most varied forms, has always given sensibly identical results. The results have been the same whatever the substance employed; or, if any perceptible difference has been exhibited in one or two cases, it should be attributed to the difference of hydration in certain substances employed.

2. *Gelatinous Substances.*—All gelatine gives, to equal weights of dry organic matter, the same results. We have sized a sheet of paper with an equal dose of the following substances:—parchment size (commonly known as white size), Flanders size, Givet size, white transparent size, and fish size, and we at once perceived a striking difference between the proofs sized with these different substances. To take only one example; if we consider those known as Flanders size and Givet size, we see that in an equal dose (5 per cent.) the first gives a much redder and more vigorous proof than the second.

In examining these two sizes from the point of view of their composition, for the reason of these variations, we soon saw that, though identical as being organic matter, they differed greatly in respect of the quantity of mineral matter they contained. In fact, when calcined, they left a

* Quoted from the official organ of the Photographic Society, Vol. V., p. 19.

residue formed of the product of the decomposition of the alum employed in clarifying them, and this residue amounted

For the Givet size, to	2·5 per cent.
For the Flanders size, to	4·7 per cent.

If it be remarked that the greater proportion of residue corresponds with the reddest and most vigorous proof, it will be readily understood that we were at once led to consider the alum as the primary cause of this difference, and to essay its action from this point of view; and the result of experiments confirmed our anticipations. In fact, taking any ordinary sheet of paper, if we sized one half with alumed gelatine, at 2 per cent., we found that the picture on this half was far redder than on the other. Still better, this precise and general action of the alum, whether ammoniacal or potassic, exercises itself equally on all the manufactured papers, and on those which have an additional sizing of starch, as direct experiment has shown us. In fine, gelatinous substances employed in an equal dose, and a deduction made for the mineral matter, produce the same effect; strengthened with alum, they give redder and more vigorous proofs.

3. *Albumenised Substances.*—Albumen, which naturally we had not been able to examine when studying the sizes used in manufacturing, necessarily engaged our attention for some time, for the especial reason that it constitutes the additional sizing most frequently used among photographers. Albumen gives a red colour, an *éclat*, and a vigour to proofs, which is greater in proportion to the quantity of that substance used. Treatment with water containing only $\frac{2}{10}$ of albumen, suffices to produce a modification; with $\frac{3}{10}$, $\frac{4}{10}$, $\frac{5}{10}$, the vigour augments; from this point the brilliant varnish due to the albumen appears, and goes on increasing for $\frac{6}{10}$, $\frac{8}{10}$, and finally attains its maximum with pure albumen. The ammoniacal albumen acts like ordinary albumen; it gives a more vigorous proof in proportion as the quantity is greater, but its energy is perhaps of a degree inferior to that of ordinary albumen. The dried albumen of commerce, employed in the dose of 12 parts of albumen to 100 of water, gives a less clear solution, but which may, notwithstanding, be perfectly utilised instead of fresh albumen, which it replaces in the most perfect manner.

(*To be continued.*)

ON THE DEVELOPMENT OF NEGATIVES BY GALLIC ACID.

BY M. LASSIMONNE.

The following communication was addressed to the Editor of the *Revue Photographique*:—In a communication published in your columns, I suggested the employment of gallic acid, concurrently with acetate of lead, as a powerful and rapid developer; but the manipulation, which is extremely delicate, requiring great practice, only a few persons have succeeded in their attempts at using it. The failure arose from the manner in which the acetate of lead was employed.

My persistence in the use of gallic acid to develop negative pictures enables me to simplify in a singular way this process. The acetate of lead is now to me but a matter of secondary importance; I can do without it by substituting acetate of lime or ammonia. My mode of operating is as follows: after having saturated a certain quantity of alcohol with gallic acid, I add, as soon as the dissolution is complete, a volume of water equal to that of the alcohol, I then strengthen the mixture with five per cent. of acetic acid, and filter.

In another way, I dissolve 2 parts of acetate of lead in 100 parts of water.

When the collodionised glass has received the luminous impression, I pour on its surface a certain quantity of the first solution, that is to say, the mixture of alcohol, water, and gallic acid, and the picture appears immediately. After having allowed it to exercise its action for a time, I add, if the proof wants vigour, a small quantity of aceto-nitrate of silver, or of the sensitising bath. At the end of three or four minutes the picture will have acquired the desired intensity.

If it be desired to hasten the coming of the picture, it will suffice to add to the liquid some instants before the appearance of the image in its details, one drop of the solution of acetate of lead mentioned above. With this process the time of exposure in the camera is less by two-thirds than when the pyrogallic acid is used; but the great recommendation of this mode of development is the excessive delicacy and sharpness of the pictures, which may be compared in these respects with the proofs obtained on albumen.

It is very important not to develop the picture overmuch, for the greenish yellow colour which characterises it will render the passage of the luminous rays difficult in printing positives. A very light negative gives excellent results.

This mode of development allows all collodions to be employed indifferently; I think, however, it will be well to give the formula I myself employ habitually, and with the most satisfactory results.

I compound an iodurated liquid as follows:—

Alcohol at 36°	150 parts.
Iodide of potassium	5 „
Iodide of ammonium	5 „
Iodide of cadmium	5 „
Iodide of zinc	5 „
Bromide of ammonia	1 „
Bromide of cadmium	1 „
Fluoride of potassium	1 „

I first dissolve the iodide of potassium in the entire quantity of alcohol, and then add the other substances in succession, which dissolve easily; this solution, put in a flask, is always kept in a zinc bath, which allows the liquid to retain a complete neutrality. Six or seven parts of this solution to 100 of normal collodion is the proper proportion.

ON VARIOUS METHODS OF PRESERVING PHOTOGRAPHS AGAINST CHANGE AND DESTRUCTION.

BY M. VON MONKHOVEN.

1. To fix a positive proof in a durable manner it should be washed as thoroughly as possible in water, on being withdrawn from the copying frame, in order that there may only be in fixing an extremely small quantity of silver.

2. The hyposulphite of soda bath ought to be used in a concentrated state, in order that the hyposulphite of silver formed may not remain in the texture of the paper.

3. In the fixing bath, prepared with 300 parts of hyposulphite of soda to 1000 of water, not more than about 20 proofs of a large size should be fixed.

4. More than 6 proofs should never be submerged in a bath 1½ inches in depth, at one time.

5. There should never be mixed in this bath either an acid, an alkali, or any substance capable of eliminating sulphur; or, if any such body is introduced, the bath should remain undisturbed for at least fourteen days before using it again.

6. An old hyposulphite of soda bath, in which a black precipitate of sulphide of silver is observed, ought no longer to be employed for fixing proofs.

7. It will always be advantageous to strengthen the picture in a neutral gold bath, because the gold deposited preserves it, in any case, against every kind of gas contained in the atmosphere which could exercise a destructive action upon it.

8. The proof taken out of the fixing bath ought to be carefully washed in a sufficient quantity of water, frequently renewed; nevertheless, this operation ought not to be prolonged beyond 24 hours.

9. Care should be taken that the substance used for fastening the proofs upon the pasteboard, should not be capable of acting chemically upon the picture; gum and gelatine are the best substances to employ for this purpose.

10. The proofs thus mounted ought to be kept in a dry place.

Lessons on Colouring Photographs.

COLOURING has been said to be "the sunshine of art, that clothes poverty in smiles, and renders the prospect of barrenness itself agreeable, while it heightens the interest, and doubles the charms of beauty." The reproduction of objects in their natural colours, by means of the camera, is a subject which has occupied much of the attention of many of the most illustrious pioneers of photography; but, as yet, without definite result. Until that problem is solved, to give photographic portraits their full value as *likenesses*, to give them life and individuality, the photographer must have recourse to the art of the painter. We purpose, therefore, to lay before our readers, in a series of articles, the simplest and most efficient mode of colouring positives on glass and paper, in photographic powder colours, water colours, and oil colours, so as to produce satisfactory and artistic results. As many of our readers are, doubtless, entirely inexperienced in this branch of the art, we shall begin at the beginning, and endeavour to make the matter clear to the most uneducated capacity: premising, however, that whilst much is possible to steady perseverance, there is not here, as there is not in any of the arts, any royal road to success. To obtain perfect results will require the constant exercise of a careful hand, a practised eye, and a cultivated judgment. We shall commence with the process of—

COLOURING POSITIVES ON GLASS.

The first step necessary is to procure the requisite materials. To have even the slightest chance of success, it is important that these should be good in quality, and prepared for their purpose under the superintendence of persons practically acquainted with the requirements of photography. It has, unfortunately, happened, that this condition of success has not frequently received attention, and that much of the artistic material appertaining to photography has been, like the pedlar's razors, made for sale and not for use. As it is obvious that we cannot here refer to the productions of individual manufacturers, we will, as far as possible, minutely describe the proper characteristics of material suitable for producing good results.

Photographic Powder Colours.—These furnish the only suitable and simple means of colouring collodion positives on glass. They are applied in the form of impalpable powder, with a dry pencil, to the collodion film. They should, if properly prepared, be brilliant in colour, transparent, and, as far as possible, permanent; they should, at the same time, "bite" well, or adhere readily to the surface of the plain or varnished collodion film. Some colours there are which appear brilliant enough when seen in bulk; but which, from being manufactured of inferior and unsuitable pigments, or from being imperfectly prepared, have an insipid and dull effect when applied to the picture, and, at the same time, rapidly fade when exposed to light. Others, from similar causes, are entirely destitute of transparency; and, when applied to the photograph, obscure both lights and shadows, and give to the whole a muddy, flat, coarse appearance. As dry colours are applied to the half tones and some of the shadows as well as to the lights of the picture, it is obvious that unless they possess the utmost transparency, they will mar rather than improve the photograph. And, however pure in tint or delicate in texture, unless they *bite* sufficiently with very simple manipulation, good results cannot be hoped for. Some manufacturers, in order to secure this "bite" in their colours, add a portion of some resinous gum in grinding; the desired result is, to some extent, generally secured by this means, but with this drawback, that when the picture is varnished the gum is dissolved, and the colours consequently run. The best colours we have used are prepared by some peculiar process, known only to the manufacturers, which secures a facility in applying them that leaves nothing to be desired. Powder colours are prepared in tints suitable for every purpose, and, if a proper selection is obtained, rarely require mixing. A recent writer, speaking of these colours, intimates that, if they be found too powerful, they should be "reduced with *white*, which bears the same relation to powder colours that water does to ordinary cakes." Such a remark could only arise from an entire absence of practical knowledge on the subject, and, if followed, could only lead to disappointment. Dilution of cake colours by means of water not only abates their intensity, but increases their *transparency*, by so much as it thins the layer of pigment on the picture. The addition of *white* to powder colours, on the contrary, whilst it certainly lowers their brilliancy, at the same time increases their *opacity;* it also imparts a cold, dull, unnatural effect. Colours ready-prepared of the required delicacy of tint should be procured at the outset, especially for flesh tints; by all means we should avoid the brickdust-like powders, which, applied to the photograph, yield a complexion like that of a Red Indian. We cannot here enumerate the tints required: we merely remark that, the more complete the variety, the more easy and pleasant will the practice become, and the more satisfactory the results obtained. We have dwelt sufficiently, we think, on the characteristics of good colours to impress the reader with the importance of possessing them, and to guide him in selecting them.

Brushes.—The quality of these is not of less importance than that of the colours. The camel's hair and sable pencils prepared for use with water colours will not do; they should be manufactured expressly for this purpose. For general use camel's hair is more suitable than sable: the hair should be short and thick in proportion to its length; carrying a fine, firm, and well-supported *natural* point. For fine lines a few small sables will be desirable. It is well to keep a stock of brushes ready-prepared for use; they should be agitated in a glass of clean water, and brought to a point by drawing them through the lips. The point thus produced will, if the pencils are properly manufactured, be retained when dry, and work for some time without spreading.

An India-rubber bottle, with tube attached, to blow away superfluous colour, will be required. For this purpose vulcanised India-rubber should be avoided, as the particles of sulphur are often detached, and cause spots of sulphuret of silver on the plate. A large camel's hair duster, a tube of moist Chinese white, gold and silver shells, with a varnish of which we shall have to speak hereafter, will complete the equipment.

In our next article we shall proceed to describe the manipulation in detail.

(*To be continued.*)

Photographic Chemistry.

SALTS.

1. If an acid be added to a salt, one of three things will happen,—the acid is without action on the salt, or it takes possession of the base and liberates the acid, or the two acids divide the base between them.

It is commonly said of an acid that displaces another, that it is more energetic; such acid may be more or less energetic according to circumstances. The phosphoric, boric, and silicic acids, which displace the sulphuric acid without the intervention of water, at a high temperature, are, on the contrary, driven from their combinations by this same acid, when one operates through the medium of water. Speaking generally, a gaseous or volatile acid is eliminated by a fixed acid, and a fixed acid giving soluble salts is eliminated by a fixed acid which gives insoluble salts.

2. The action of the bases on salts may be defined and classified in the same manner. Either the base does not react on the salt, or it seizes its acid and sets its base at liberty, or the two bases divide the acid between them.

The bases which, under the ordinary circumstances of experiment, displace the others, are termed the most ener-

getic; a fixed base commonly eliminates a volatile base, and a base which yields an insoluble compound displaces the base which gives soluble salts.

3. When two saline solutions are mingled together, if the acid of the one with the base of the other is capable of giving an insoluble compound, this compound is generally formed. There is, in that case, an exchange of acid between the two bases, which is what is termed the phenomenon of *double decomposition:* for example, nitrate of oxide of silver, *soluble*, $Ag\ O.\ N\ O_5$, and the carbonate of soda, *soluble*, $Na\ O.\ C\ O_2$ mingled together, give immediate rise to this double decomposition, and the result is—carbonate of silver, *insoluble*, $Ag\ O.\ C\ O_2$, and nitrate of soda, *soluble*, $Na\ O.\ N\ O_5$.

Double decompositions are made under proportional weights or equivalents; the equivalent of oxide of silver which neutralises 1 equivalent of nitric acid, also neutralises 1 equivalent of carbonic acid; in the same way, the equivalent of soda which saturates 1 equivalent of carbonic acid, also saturates 1 equivalent of nitric acid. If there is an excess of either salt, this excess remains in the liquor without being decomposed: for example, when a paper impregnated with the iodide of potassium is submitted to the action of the nitrate of silver bath, the entire of the iodine present unites with the silver, forming iodide of silver; and after this, no matter how much the contact may be prolonged, or how concentrated the bath, the reaction is complete as soon as all the soluble iodide is converted into insoluble iodide.

We may add, however, that the presence of a salt foreign to those, the reaction of which we expect; or even, in certain cases, an excess of either of the two salts employed, may give rise to different results. Thus the iodide of potassium and the nitrate of silver yield an insoluble precipitate of iodide of silver; but if the mixture is made when hyposulphite of soda, or any other *solvent* of the iodide of silver is present, the precipitate is not formed: in the same way, the nitrate of silver in excess gives a precipitate with the cyanide of potassium; but this precipitate is not formed when the cyanide is in excess, cyanide of silver being soluble in a solution of cyanide of potassium.

Of course we cannot, in this place, give a history of all the salts; but at some future time we will give a chemical analysis of the more important substances used in photography.

(To be continued.)

Dictionary of Photography.

Actinism is the term which has been given by Mr. Hunt to that principle of the solar spectrum which produces the phenomena of chemical change. It has been shown that neither the force which causes the sensation of light, nor that which produces the phenomenon of heat, has decided chemical action, and, consequently, we are driven to the hypothesis of the existence of a new form of force in the sunbeam, coexisting with heat and light. In order to designate this, the word actinism has been proposed. This word signifies nothing more than *ray-power*, and therefore, as it involves no theory, it is not open to the objections which, unfortunately, must be made to many of the scientific terms in common use.

Actinometer.—An instrument for determining the variations of actinic power. The registration of the ever-varying photographic intensity of light is so important a subject, that it has occupied the attention of several eminent scientific observers. It was noticed at a very early period that the chemical activity of the solar rays varied considerably at different hours of the day. Arago, in his address to the French Academy on the discovery of the daguerreotype process, remarked, that there was a great difference in the photographic power of the sun when observed at 10 A.M., and at 2 P.M. in favour of the latter. Further experiments soon showed that there were some alterations in the actinic properties of the light which required further investigation in order to understand it properly; and it soon became evident that great advantage would be derived from the construction of some instrument by which these photographic variations should be regularly recorded.

Mr. Jordan published a paper in the year 1839, on a "Description of a New Arrangement of the Heliograph for Registering the Intensity of Solar Light." In 1840 Sir John Herschel described an "Actinograph, or Self-registering Photometer, for Meteorological Purposes." He says, "The objects of such an instrument, which cannot but be one of material importance to the meteorologist, the botanist, and the general physiologist, may be considered as twofold, viz.: first, to obtain a permanent, and, at least, self-comparable register of the momentary amount of general illumination in the visible hemisphere which constitutes daylight; and, secondly, to obtain a similar registry of the intensity, duration, and interruption of the actual sunshine; or, when the sun is not visible, of the illumination of that point in the clouded sky behind which the sun is situated." Each of these instruments had many points of resemblance. The photographic paper was placed round a cylinder, which was inclosed in another cylinder which was moved on its axis at a certain rate by means of clockwork. A vertical slit, through which the light passed, being made in the outer cylinder, the variations of the light were recorded on that part of the paper opposite which the slit happened to be; and, by adjusting the rapidity of the movement of the cylinder so as to keep the slit always opposite the sun, the paper recorded every cloud which passed over its disc.

(To be continued.)

A Catechism of Photography.

THE WET PAPER PROCESS.

Q. Are there not several modifications of the calotype process?

A. There are, and amongst them the process adopted by French photographers is interesting and important.

Q. What is the process?

A. The operator dissolves 300 grains of isinglass in one pint and three-quarters of warm distilled water. Taking one half of this preparation, he adds to it 200 grains of iodide of potassium, 60 grains of bromide of potassium, 34 grains of chloride of sodium. As soon as the salts are dissolved the solution is filtered through a piece of linen into a large dish; into this solution the papers to be prepared, which must be of French manufacture, are then plunged, and, when thoroughly saturated, removed and hung up to dry.

Q. Can this operation be performed in the ordinary daylight?

A. It can, as in this state it is not sensitive to light. It may be preserved for a long time in a portfolio, for future use, and remain uninjured.

Q. What is the second operation?

A. 250 grains of crystallised nitrate of silver are dissolved in six ounces of distilled water. When the nitrate is dissolved add one ounce of crystallisable acetic acid.

Q. Is this solution affected by the action of light?

A. It is, and must therefore be prepared in a room chemically dark, and kept in a stoppered bottle excluded from the light.

Q. How is this solution to be employed?

A. When the operator requires it for use, a portion of the solution is to be poured into a glass tray, or on a porcelain slab surrounded by a glass or paper border. The iodised paper is then gently placed upon it, great care being taken that the face only of the paper shall be brought into contact with the solution. The paper must be allowed to remain in this position until a perfect formation of the chloro-bromo-iodide of silver has taken place.

Q. How can the operator ascertain when this formation has actually taken place?

A. The paper, when first subjected to the process, presents a violet colour at the back, which colour gradually disappears as the chemical change is effected.

Q. What time is usually occupied in this process?

A. From two to four or five minutes; but the time depends very much on the character of the paper.

Q. What is to be done with the paper so prepared?

A. A piece of white paper, thoroughly saturated and free from impurity of every kind, is spread upon the glass fitted to the frame of the camera. Upon this paper the prepared sheet is placed, with the sensitive side upwards. In this state it is submitted to photogenic action in the camera.

Q. Is it necessary to employ this paper in a wet state?

A. Undoubtedly; and this is, perhaps, its most objectionable quality; but the results obtained are often exceedingly beautiful.

Q. How is this picture developed?

A. Pure dissolved water saturated with an excess of gallic acid is used for this purpose. The operator should pour upon a slab of glass, held in a horizontal position, a little of the solution; the picture must then be placed gently upon it (as in the sensitising process) and so be allowed to remain until the development has taken place.

Q. How may this be ascertained?

A. It can easily be traced through the back of the paper, and it need not be removed so long as the back does not begin to spot.

Q. After the development has taken place, what is the next process?

A. The developed picture must immediately be washed in several waters, so as to remove any crystals of gallic acid which may have formed upon it.

Q. Is the picture "fixed" by this means?

A. No; it has to be further subjected to a strong solution of hyposulphite of soda, in which it is permitted to remain until every trace of yellowness has disappeared.

AMPHYTYPE AND CYANOTYPE.

Q. What is the *amphytype?*

A. Amphytype is an application of the calotype process, taking its name from the fact of negative and positive pictures being produced by one process.

Q. Who is the discoverer of this process?

A. Sir John Herschel.

Q. What is the *cyanotype?*

A. It is another process of calotype, so called by Sir John Herschel on account of cyanogen, in combination with iron, forming a leading part in the process.

WAXED PAPER PROCESS.

Q. What is meant by the *waxed paper* process?

A. The waxed paper process is an improvement on the calotype, and was first practised by M. Le Gray.

Q. What are the advantages of this process?

A. The waxed paper process has the advantage of preserving uninjured the sensitive papers, and, therefore, facilitating the labour of the photographic excursionist.

Q. Is the same description of paper employed in this as in other calotype processes?

A. The choice of paper, in any process, is exceedingly important and very difficult, but it is not of greater importance in this than in any other process. The texture should be uniform, the material pure and transparent, the surface smooth and firm. Papers produced by the same manufacturer are not all equally good for photographic purposes, and it is necessary to be guided by close inspection, and not by any particular name. Of all the various kinds of paper used by photographers the French manufacture of paper will be found the most invariably pure in quality, and the most free from defects. It is usually procured in sheets measuring $17\frac{1}{2}$ inches by $22\frac{1}{2}$ inches.

(*To be continued.*)

Correspondence.

PAGES FROM THE NOTE BOOK OF A TRAVELLING PHOTOGRAPHER.

SIR,—In the note you appended to my last communication, I presume it was not your intention to question what I stated as to the immovability of my camera, but simply to suggest that it might be shaky under certain circumstances—such as a rough wind, for example. No doubt, in this sense, the idea suggested by your experience is quite correct; but then I never meant to say it was immovable, or even so steady as a tripod, under such circumstances; but even the strongest tripod is susceptible of vibrations in a rough wind, as my experience taught me long ago. All through life I have been influenced by a maxim, impressed upon me by my grandmother in my childhood—"of two evils to choose the least;" and I acted under this influence when I invented a new support for my tent on going abroad. For the sake of lightness and capaciousness I took my chance of occasional annoyance from instability, which could only occur now and then, whereas its advantages would be continual. I do not recommend it to photographers who propose remaining in England, because in this country there is no difficulty in obtaining conveyances from one place to another; nor, indeed, did I *recommend* it to those going abroad. I merely stated a simple fact of my own experience, which other photographers might benefit by if they thought proper.

I believe I concluded the last communication I sent you with a reference to the advantage that an English photographer would enjoy in the French provinces, from the fact of his being a foreigner and alone. I presume, of course, that the photographer is a gentleman, and of good manners, as all those whom I have seen or spoken to on the continent have invariably been. His presence at a country house is, in that case, looked upon very frequently as an agreeable excitement, which amply compensates for any trouble his presence may occasion; and though it is a fact that many Frenchmen speak ill of Englishmen in general, yet I have invariably found them kind and amiable to the individual, as much so as we should be to a Frenchman under the same circumstances. At all events I have reason to thank many among the class of Frenchmen I have referred to, as well as their fascinating wives and daughters, for some of the best spent hours of my life; and I am happy to have this opportunity of publicly acknowledging the debt of gratitude I owe them through the medium of the "PHOTOGRAPHIC NEWS." Perhaps, however, my visits have not been without effect in extending the practice of the art of photography; for, on more than one occasion, my host has been smitten by a most intense desire to become an operator; and when, by closely imitating me, he succeeded in getting a picture of his house not altogether unlike what it was in reality, he regarded it with as much enthusiasm as the boy did his bull-pup, of whom it is recorded in the diary of the P. C.,—otherwise parish clerk:—That mischievous boy, Tommy Styles, "having trained a bull-pup to the intent that he might join in the baiting of the bull at Easter, did desire his father, as he one day entered the yard, to fall upon his hands and knees and bellow like one bull, which, he doing, the boy did loose the pup, and the brute did seize the silly old man by the under jaw, and did hang on thereby, he trying to shake him off, and the boy to dance and cry, 'Bear it like a man, father, 'twill be the making of the pup!'"

There is one piece of advice which I may give to those whom I am now addressing, who, if they are not accustomed to French society, may misconstrue the meaning of the frank and cordial bearing of French ladies—and that is, to banish from their minds any ideas respecting them which they may have derived from French novels and plays, the writers of which represent inconstancy in a wife as almost a virtue, and their countrywomen as being in the habit of practising it very extensively. Let them be assured, that

women in France are much the same as women here; and that the conduct which would give offence to a sensible Englishwoman, would be not less likely to do so in the case of a Frenchwoman. I am the more anxious to impress this on the minds of my travelling countrymen, as I once had to spend three weeks at an inn with a friend, who had had the flesh on his breast ploughed up by a bullet, which had been fired by a justly-incensed husband in return for too pointed attentions paid to his wife—an indiscretion of which I am well assured my friend would not have been guilty but for the erroneous opinion he had formed of Frenchwomen from the cause above stated.

After this long digression, into which I have been led from the consideration, that the majority of photographers who go on the continent for amusement, and who take their camera with them as an additional means to that end, will prefer France to Belgium, I return now to the latter country; and I would strongly advise any photographer whose primary object is to obtain pictures, to visit Belgium in preference to any other country. The proximity of the various towns, and the railways that connect them, render travelling easy and inexpensive: neither is there any difficulty in getting chemicals from Brussels, in whatever part of Belgium one may be. Moreover, the communication with England is so constant and frequent, that there is no necessity for a man to carry about with him a lot of plates. When a sufficient number of negatives have been obtained in any town, they may be securely packed and transmitted to England, where they may be printed from at once.

I have already remarked, that Bruges offers very many objects worthy the attention of photographers; at all events, I found many more than I was able to photograph. The first which I took was of the market-place, at an early hour in the morning, when it was crowded with country people, who had brought in their fruit, vegetables, butter, &c. The curiously-shaped caps of the women, their short petticoats, and the picturesque character of one or two of the buildings, make it a very pretty picture, and one well worth preserving. The principal objects of interest to the photographer in Bruges are, the churches of *St. Jacques* and *Notre Dame.* The *Hôtel de Ville* is a handsome specimen of Gothic architecture, and is of a size which renders it easy to be taken in a camera of ordinary dimensions. The *Palais de Justice* offers a subject which is pretty from one point of view; but a larger and more interesting picture may be obtained of *Les Halles*, including the celebrated belfry. The lower part of this structure is used as a flesh market; and if the early morning be chosen for taking the photograph, this circumstance adds to the interest of the picture, as it gives it an amount of animation not to be obtained under other circumstances—the streets of Bruges, formerly so populous, being now almost deserted; this, however, is an advantage, rather than otherwise, to the photographer. I have frequently planted my camera in the middle of a street without having ever found it necessary to remove it on account of vehicles. Besides the buildings I have mentioned, there are very many others which, although they have no historical celebrity, make exceedingly pretty pictures.

The photographer, who necessarily possesses a certain amount of taste, will here find much to gratify it. Most of the churches, as well as one or two other buildings, contain fine paintings by Rubens, Van Eyck, Hemling, or other painters of note. During my operations here, I did not attempt to take the interiors of the churches, and therefore cannot say that such a proceeding would be allowed; but I am of opinion, that a polite note to the proper authority would obtain permission to do so; and, in this case, many pictures of great beauty might be obtained. VIATOR.

ON POSITIVE PRINTING.

SIR,—For printing positives, I find the following sensitising fluid for the paper the best and most economical I have ever used. As the formula was communicated to me without any reservation, I do not hesitate to give it for the benefit of those who may not have heard of it:—

80 grains of nitrate of silver must be dissolved in 1 ounce distilled water, and when dissolved, ammonia must be carefully dropped into it, until the precipitate is dissolved, and the liquid is quite clear. It must then be put into an 8 ounce bottle, and 7 ounces of alcohol added. It should be kept in the dark, and may be used over and over again to the last drop. The paper should be salted with about a 4 grain solution, by immersion, and, when dry, floated on the silver solution until the liquid comes through the paper, which it does very quickly; the dish must then be moved, so as to cause the liquid to flow evenly over the back. Air bubbles are seen at once, as the paper is quite transparent when in the bath. The papers are very sensitive, but will not keep long. I tone the proofs (after washing out the unaltered chloride) with an extemporaneous sel d'or bath; it is, I think, the safest and most economical plan for large proofs. I spread some of it evenly on a glass plate, and lay the proof, face downwards, on it for a minute or so, and then turn it up, and, with a glass rod, keep the fluid evenly over the proof till toned sufficiently. After slightly washing I put the proof in a hypo. bath, of the strength of 1 ounce to 10 of water. It must then, of course, be properly washed. Where there is plenty of water, I find a very useful washing apparatus may be constructed of a box, which should not be very deep, with the bottom removed, and a piece of calico strained across instead, on which the proofs must be placed *separate;* the top is made to go inside the box about half an inch, on to stops at the corners. It is pierced all over with holes, which spreads the water. The box is suspended to a tap, and the water passes through the proofs and the calico. The water must not be allowed to flow too fast, or the proofs will float about, and perhaps adhere to the top or sides of the box, and stick together.

Reigate. THOMAS BARRETT.

THE RASPBERRY SYRUP PROCESS.

SIR,—Is it possible that we have to record another article to the thousand and one already published, for the preservation of the collodion plate? I allude to the raspberry syrup published in the *Times*, and in your journal of last week.

Truly the art has no legitimate limits, but it appears there are "chemical reasons" for using that article. Now, sir, in common with the majority of amateur photographers, I am not a practical chemist, and I may be expressing the wishes of many when I say that I should like to know what those "chemical reasons" are. My knowledge extends no further than the use of the various articles named in works on Photographic Chemistry; but raspberry syrup not yet having found its way into those manuals, I shall have to provide myself with a work on "Domestic Cookery" to prepare for any contingency.

I have also an idea of commencing a series of experiments with *red currant jelly*, and endeavouring to discard the collodion film altogether, unless some of your readers can give me "chemical reasons" why I shall not be likely to succeed.

But, I would ask, is the laboratory to supply us with the ingredients which shall lead us on to perfection in the art, or are we to explore the precincts of the domestic cupboard? On the part of the female community I would object to any such invasion of their sacred territories—there are *domestic reasons* for such objections. But, sir, it is not sufficient to say that a new process is *equal* to any of the others; more than this is required; and I would not condemn that restlessness amongst photographers to discover some really good and sure means of preserving the collodion plate in a dry state; such a want does exist, but I would respectfully suggest to those who may be experimenting in this direction to bear two things in mind—viz., that the process must not require any special collodion, and must be equally as sensitive as the moist collodion plate; and, failing to produce

these results, in the name of all that is photographic, spare us the trouble of such profitless reading; for I think the space occupied in the descriptions of these various modes of manipulation could be filled with matter of much greater advantage and interest to the general reader.

Bradford. J. H.

STEREOGRAPH *v.* STEREOGRAM.

SIR,—Will you suggest that stereo*gram* is incorrect? Tele*graph* has, in our day, been properly altered to tele*gram*, being a thing of words; but stereo*graph* is a delineator as is photo*graph*. Were *gram* correct it might, with equal propriety, be called photogram; which, if attention be not called to the point, we may not be unlikely to see.

Yours, &c., SOL. HYPO.

[We have purposely introduced the word "stereogram" to designate a stereoscopic picture, instead of stereograph, as this latter word would more properly belong to an *instrument* whereby stereograms are taken (in fact such an instrument has been described under that name), and the analogy of other English words, such as telegraph, perspectograph, &c., would thereby be preserved. With respect to the word photogram, the introduction of which our correspondent seems to regard with such horror, we can inform him that some of the first scientific men in England have, for some time past, been in the habit of using that word. We fear that *photograph* is too strongly rooted in the language to be supplanted by photogram, but we should not be sorry to see the barbarism stereograph nipped in the bud. In all words compounded of a substantive and a derivative from the Greek word γραφω, it should be borne in mind that "graph," the derivative from the present tense active of γραφω, cannot be properly applied except as signifying the agent or instrument that performs the act. Anemograph, from ανεμος, wind, and γραφω, to describe; actinograph, from ακτιν, a ray of the sun; thermograph, from θερμος, heat, &c., &c., all signify the indicator and not the thing indicated. "Gram," on the other hand, a derivative from γεγραμμαι, the perfect passive of γραφω, should always signify the thing described or indicated, as: telegram, the notice given by the telegraph; photogram, the likeness described by the photograph; stereogram, the effect produced by the stereograph.]

Photographic Notes and Queries.

HINTS TO BEGINNERS.

SIR,—The future of photography is very encouraging. The "good time" seems to be coming. If every amateur who reads the "PHOTOGRAPHIC NEWS" is only half as thankful to you as myself, you will receive something more useful and substantial than thanks, in the hearty recommendation and extended circulation of the work. It has been admirably well-timed, and if you go on as you have begun, keeping as closely as possible to the practicable and the useful, you will be sure to succeed.

Thanks are due, and I have no fears but that they will be very generally expressed, to Mr. Fox Talbot for the liberal manner in which he has enabled you to make known his newly-discovered process of photoglyphic engraving. The pictures are wonderful; not only in the sense of being first specimens, but as having been produced in the way the inventor has so simply described. It is worth a "note" that Mr. Fox Talbot's specification contrasts favourably, on the side of common sense, with the generality of such documents.

Now permit me to say a few words to the many amateur workers, who are looking up to you for counsel and assistance. As the result of my own experience I advise them to trust less to books and more to themselves. Perhaps, I have read as much upon photography, during the last four years, as any one in the United Kingdom; and whilst I by no means intend hereby to discourage the reading and studying of what others have to say, I still maintain that not one amateur photographer in a hundred will become even moderately successful if he follows too literally the instructions contained in books. In saying this it is far from my intention to underrate the knowledge, or doubt the veracity, of any of the writers upon this subject. Each is undoubtedly right in his own process, and in the sense in which he manipulates. But unless many of the processes can be seen from first to last in actual operation, I believe it to be almost, if not quite, impossible to imitate them from ordinary written instructions. There are some exceptions, and they are *only* exceptions.

During a long period of failures, and vexations, and disappointments—the common lot of most beginners in the beautiful art of photography—I many times thought it would be the best plan to burn all my photographic books, pamphlets, and other forms of instruction. Without being quite so rash, I did the next best thing—put them into a cupboard, and referred to what are considered the best authorities, only in cases of extreme difficulty. By applying the knowledge I had previously attained, by asking a question, as opportunity offered, of a person wiser and more skilful than myself, and by exercising what is implied in that (vulgar?) expressive word *gumption*, I am now able to take a good (negative) portrait, and print it clear, and bright, and durable. What I have accomplished under many disadvantages, with only a few scraps of leisure, and amidst interruptions of weeks and months in duration, others, more favourably circumstanced, ought to do a great deal more. And yet I know persons who have been at work at photography a longer period than myself, with first-rate apparatus, a greater amount of leisure, and many appliances which I am not likely to possess, who have never produced a picture worth looking at, and seem as far off from doing so as they were three or four years ago.

There must be a *cause* for continual failures. I don't believe it is always to be set down to unskilfulness. If no one else will try to explain the cause, I will do what I can myself.

This has been rather a long "note." I conclude with a few "queries."

Is there any simple and really good plan for producing a halo upon the collodion negative? (I have seen, I believe, all the suggestions hitherto offered, some freely and others for money, but I don't think one of them *simple* and *good*.)

Is there any improvement in what are called the *vignette* glasses? These are perfectly useless without cotton, wool, and other contrivances, which occupy much time and often fail of their object.

In fitting up, say, for the ensuing spring, a new glass-house for taking portraits, what is the best colour for the inside of the house, for the back-ground (negative process), and the curtains and blinds? * * * *

November 15*th*, 1858.

ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES.

SIR,—In a previous letter signed "Subscriber," which you did me the favour to insert, I referred to a new artificial light invented by the Honourable Major Fitzmaurice. I have since received from that gentleman some particulars respecting the light, and having obtained his kind permission to communicate his statement to you, I beg to inclose a copy of it, believing that it will be read with much interest.

H. D. H.

"The light is adapted for every purpose, from a table lamp to a lighthouse. I have had my own portrait taken by photography by it, and I am applying it to every kind of purpose.

"I can burn an ordinary lamp, equal, by photometer, to two of the *best* French carcel lamps, or to four gas burners, at the rate of ½d. per hour.

"I had a trial at Paris, last week, with the full power light against 444 gas burners in a drawing room 145 feet by 45 feet and 35 feet elevation, and with *one* light, I could read any newspaper with perfect ease from one end of the room to the other. The cost of these 444 burners at two hours per evening, came to 6 centimes for every burner, or about 2,300 napoleons per annum. *Two* of my lights do not come to 60 napoleons per annum, giving a light exceeding these 444 burners. This appears almost incredible, but I took the data from some of the first chemists in France, who were present. With a single lamp you can read your watch perfectly at 600 or 700 yards. A company are purchasing my interests, and will shortly publish their mode of working."

VARNISH FOR NEGATIVES.

SIR,—I shall be much obliged if your correspondent, who signs himself "One of Devon," in the last number of the "PHOTOGRAPHIC NEWS," will be so good as to reply to the following questions relative to his communication. Is no retarder used, in the form of either acetic, or citric acid, in any of the processes? Is no free nitrate of silver employed in the development of the picture on the dry collodion film, and how long does it require with gallic acid instead of pyrogallic acid? Does the dry collodion film bear the subsequent treatment and washings without disturbance, as, in the various collodio-albumen processes, this is one of their greatest merits?

In reply to your correspondent, signing himself "Lucius Veritatus," I would recommend him to use plain gum (arabic) water, about the consistence of syrup, instead of a spirit varnish for glass positives; indeed, I find it answer very well for all the purposes of a spirit varnish. As a protector of the collodion negative it should be used immediately after the last washing, and the picture dried in the usual way, as quickly as if without the gum; and, if necessary, to make it quite dry and hard before a fire, or over a lamp, or candle. Or a solution of gelatine, previously warmed to liquify it, might be used in the same way, with, perhaps, less risk of accidental injury from moisture, &c. E. T.

Brighton.

SUBSTITUTE FOR A GLASS ROOM.

SIR,—I trust you will excuse an entire stranger's addressing you upon a subject mentioned in an early number of the "PHOTOGRAPHIC NEWS;" I allude to the query about taking portraits in a tent of calico, and rendering it waterproof. As expense is, of course, of great consequence to many who would like to pursue this interesting art, I would suggest that I believe fine white calico, saturated with a solution of white wax in pure turpentine will be found to answer very well.

I have only paid attention to photography for the past twelve months. I was induced by a friend in London to attempt it, and my princial motive was to obtain portraits of my friends—especially naturalists, having given up most of my leisure time to natural history, especially entomology. I have succeeded in my calico tent far better than I expected, and if you would like to see one or two specimens taken in it, I will, with pleasure, send them to your publishers.—Yours very truly, HENRY DOUBLEDAY.

[We shall be very pleased to see the specimens alluded to by our correspondent. If he will kindly forward them as he proposes, carefully packed, we will take every care of them.]

WHAT TO AVOID IN PHOTOGRAPHY.

A correspondent, K. S. T., has suggested to us the collection of some short notes under the above title. As a first instalment we append the following; and if our readers approve of the idea, we will gladly find a corner for similar contributions each week:—

Do not have more light in the dark room than you can conveniently work by.

Do not let the positive paper exciting bath become alkaline.

Do not use pyrogallic developing solution when it has become brown.

Do not, as a rule, redip the plate in the bath before developing.

Do not use collodion before it has well settled.

Do not work with a turbid nitrate bath.

Do not filter silver solutions when allowing to settle and decanting them will do equally well.

Do not allow much time to elapse between exciting and exposing the plate.

ANSWERS TO MINOR QUERIES.

THE POSITIVE PRINTING PROCESS (vol. i. p. 86).—*J. D.* has sent some specimens and several queries on the above process. The substance of the questions seem to be—1. As to obtaining vigorous blacks. 2. The silver solution becoming discoloured. 3. Throwing away the solution of gold. 4. As to the bath for negatives.—1. The chocolate colour of the print is occasioned by not leaving the print quite long enough in the gold solution. To produce a deep black, the action of the gold should go on until the print is decidedly purple in tone; then the fixing operation removes all the blue inky appearance (if it has not been much too long in the gold), and gives it a slightly reddish-brown look; but, on the print, when nearly dry, being ironed with a hot smoothing iron, the black will become clear and decided. Of course, in exciting, the paper should be four or five minutes in the bath, as that also makes the tone blacker and better. 2. The silver solution always becomes discoloured, but it does not affect the result at all until it grows to an *inky* blackness. A teaspoonful of kaolin (*level* full) added to 3 or 4 ounces or more of the solution, well shaken up, and left a few hours in the light, will clear it at any time; then filter through blotting paper. Often, however, a scum forms on the top of the liquid, which may be removed by dragging a bit of paper along the surface, when the scum will cling to it. 3. The solution of gold may be kept, and a little fresh gold added now and then; but as one may easily measure the quantity (or very nearly so), we recommend every one to use it fresh, as we think it works much better. 4. As to the order that the bath is in, we think the print speaks well; for the appearance of the blacks and white show power enough to print clean, as also to give the detail in the dark shades. The bath should be very slightly acid, the pictures are then cleaner.

PUTTING TOGETHER A PORTRAIT LENS.—*X. Y. Z.* dismounted a double combination lens for the purpose of cleaning, forgot the arrangement of glasses, and since then has not been able to put them properly together again. *X. Y. Z.* should have sent us some data as to the different focal lengths of the various glasses, as the answer would have been thereby rendered less difficult: we will, however, give him and our other readers as much general information as we think will be useful to any unfortunate photographer who may happen to have thrown his portrait lens into a state of "pie." We will suppose the portrait combination to be of the usual construction. The first step will be to give each crown glass its own flint glass achromatiser. Each of the crown glasses are double convex. One of the flint is either plano or double-concave, and the other is concavo-convex; *both*, however, are dispersing lenses: call the former, No. 1 flint, and the concavo-convex, No. 2 flint. Now take one of the crown glasses and place it next to the most concave side of No. 1 flint; roughly measure the focus of the compound lens, and put it down; do the same with the other crown glass, placing one of its sides in contact with the concave side of No. 2 flint, and measure the focal length of that pair; afterwards exchange crown glasses, and repeat the measurements of the foci. That arrangement of crowns and flints which gives the *least* difference between the foci, is the proper order in which they are to be united. That found, call the crown which is with No. 1 flint, No. 1 crown, and the other No. 2 crown. Take Nos. 1 crown and flint and place them together, so that the least convex surface of the crown is in contact with the most concave surface of the flint, and arrange them so that they form the front combination—the crown being outwards and the flint inwards; and then arrange the Nos. 2 crown and flint, so that the most convex surface of the crown is next to the concave surface of the flint lens. These, however, do not usually touch, as a

ring of brass is inserted between them. The crown glass should form the outer one in this combination also. Most frequently, however, the front pair of lenses, having their contact surfaces ground to similar radii, are cemented together with Canada balsam, so that the above process may be considerably simplified. *X. Y. Z.*, and others in a similar predicament, will find it advantageous to take a pencil and a sheet of paper and make a rough sectional diagram of each of the lenses, and see that they fully understand the above description before attempting to put it into practice.

Albumen for the Collodio-albumen Process.—*Clericus.* A good formula is the following:—

White of egg (very fresh)	2 ounces.
Distilled water	2 ounces.
Strong solution of ammonia	10 drops.
Iodide of ammonium	12 grains.

Put into a large bottle, and shake for some time; then allow it to settle, and filter through a sponge. Place in it a piece of camphor the size of a pea, and it will keep good for six months. We hope shortly to lay before our readers a detailed account of the collodio-albumen process, with all the latest improvements both in manipulation and formulæ.

Fixing Positives with Bromide of Potassium.—*Paper* informs us, that he knows of positives on albumenised paper having been fixed for several years with bromide of potassium, and he has never heard of one fading. Mr. Talbot originally recommended bromide of potassium, in the proportion of about 10 grains to the ounce of water, for fixing both negatives and positives; and we have seen pictures fixed in that way which have shown no signs of fading after many years. The objection seems to be, that the bromide of potassium does not dissolve the undecomposed silver salt out of the paper, but merely destroys its sensitiveness to light, and therefore it was set on one side for the more theoretically perfect object, hyposulphite of soda; now, however, photographers are beginning to suspect the permanence of all hypo-fixed paper positives, it would be worth a trial whether a return to the original bromide of potassium fixing would not possess some advantages. The process is very simple:—Prepare the paper and expose, as usual, under a negative until the best visible effect is produced (do not over-print); then wash the silver from the paper in two or three waters, soak for ten minutes in a ten-grain solution of bromide of potassium, wash slightly in two or three waters and dry. The whole operation may be completed in twenty minutes.

To Restore Old Collodion.—*T. K. S.* In addition to the method of restoring the sensitiveness of old collodion by the addition of a piece of metallic silver, zinc, or cadmium, a correspondent has informed us that, if a few clean iron filings are shaken up with about enough collodion for one day's work, the iodine will unite with the iron, forming protoiodide of iron, and the sensitiveness of the collodion will be very much increased; it will not, however, keep for more than a day.

Amber Varnish.—*Iodide* asks how amber and chloroform varnish is prepared. Put one part of finely-powdered amber, and one part of clean-washed sand, into a bottle with eight parts of chloroform; allow it to stand for some days, shaking occasionally; strain through muslin, and squeeze the liquid from the interstices of the spongy residue of the amber and the sand; then filter through bibulous paper. The best place to procure pure amber is at large tobacconists, or meerschaum importers; broken mouthpieces of pipes may be procured there of any desired purity and at about two shillings per ounce. We do not much like amber varnish as it is so easily scratched.

Pins for Hanging up Paper.—*J. Jones.* Purchase a box of fine French hair-pins, bend one of the prongs back about half way, so as to form a hook, and pierce the corner of the paper with the other prong; the paper will thus hang in the original angle which is protected with varnish. The hook bent in the other prong can be hung over a stretched cord.

TO CORRESPONDENTS.

W. L. Theddingworth.—H. E. R.—James S.—Th. So.—No. 96.—Liberty.—A Sincere Friend.—A. B. C.—An Ex-member of the Council.—No Monopoly.—N. H.—W. S. C.—Subscriber.—Photo.:—We are very thankful to our correspondents for their friendly wishes; but, having treated the subject somewhat at length in our Leader, it would not be right to occupy our columns with further comments on the subject.

C. E. W.—See vol. 1. p. 72. A ½-plate camera and portrait lens will be required. For expense, consult our advertising columns.

H. S. N.—We believe they are imported from France; but do not know any further particulars.

K. S. T.—Such stains are rather common with Fothergill's Process; read the report of the Manchester Committee in the present number. The great advantage of the collodio-albumen process is, that such stains as you complain of may be removed by slight friction, without injury to the picture. Try a little more acetic acid in your developing solution. We are much obliged by your suggestion; and have, as you will see, made use of it. We shall be glad of further contributions.

F. M. Y.—No. The light must first pass *through* the picture to be copied, before it falls on the plate.

J. M. D. P.—No portraits have, to our knowledge, been taken by gas-light. The time usually taken by the artificial lights is from 10 to 20 seconds. The funnel can go into the chimney. Try it.

Churk.—It would be impracticable for us to have anything to do in the matter.

C. Warrington.—Your bath is in a hopeless state; extract the silver from it, and make another.

An Amateur, P.—Supposing you succeeded in taking good pictures on the steel or copper plate, it would require rather extensive apparatus, and a certain skill, to print off good impressions.

A Veteran.—Try the varnish given in the present number.

Subscriber, and Amateur, D.—We will give the process in an early number.

Paper.—We have heard that if re-sensitised it will restore it to its original condition, but we have never had occasion to try.

B. Mayne.—1. Cadmium collodion will keep good for many months. 2. See the note on the subject in the present number. 3. In our next. 4. In an early number. Gutta percha will dissolve in benzol or chloroform.

J. T.—You should have allowed it to dry a little before heating it over the spirit lamp. The solution must be kept in the dark.

M. E. White.—Your first two requests shall be attended to. We shall be very pleased to receive a description of your field box. Many amateurs are not successful with the dry processes, and anything which tends to simplify wet collodion in the field will be a boon to them. Ordinary gas or lamp light will not do for portraiture. The success which attends the use of the artificial light mentioned from time to time is rather uncertain. Letters to the Editor must take their course. We cannot set aside our numerous correspondence to satisfy the impatience of one individual. Had your business letter been sent to the publishers, it would have met with prompt attention. Only two of your letters have reached us, 14, and 21.

J. C.—The ordinary negative developer with pyrogallic acid; expose a little longer.

T. Barrett.—The photoglyphs shall be sent. Your enlarged pictures are very good; we should like to have an account of the process by which they were obtained. We will endeavour to arrange the formulæ as you suggest.

Inquirer.—The oxyhydrogen light does not contain a sufficient volume of the chemical rays of light to make it available for portraiture; it would, besides, be far more expensive than the pyrotechnic lights which have been given in previous numbers.

C. W. W.—Your bath is spoilt. Reduce the silver, and make a fresh one.

Da Lucem.—The method of imparting the peculiar glaze to the stereoscopic pictures you allude to, is kept a secret. It is a rather complicated and difficult process. Oxgall will make the colours lay evenly on albumenised paper.

W. J. W.—Answered in this number.

W. G. G.—1. Positive collodion is usually thinner than negative. 2. Chloride of gold does not *spoil* by keeping, it merely attracts water from the atmosphere, and dissolves. The best plan to keep it is to dissolve it in a known quantity of water, so that, for instance, 1 drachm of water should contain 1 grain of chloride of gold. 3. Consult previous numbers. 4. Just below a red heat.

Enamelled Iron Tablets.—The manufacturer or agent of these tablets will find it advantageous to advertise in our pages, as many correspondents have inquired where they are to be obtained.

H. V.—1. The lenses of a magic lantern are usually of too inferior a quality to employ for photographic purposes. 2. Wash well before fixing.

Anti-Hypo.—Arrangements are not yet completed for giving the public the full benefit of the art.

A Regular Subscriber.—We are obliged by your correction. It shall be attended to.

E. S. H.—We will give the subject early and careful attention. Can you, to facilitate our experiments, give some further information about this mode of manufacture,—what they are made of, sized with, &c.?

E. A. P.—The quantity of camphor to be added is quite optional. Put in a piece the size of a pea.

H. B. Swansea.—The specimens which we saw were very good. We have made further inquiries respecting "One of Devon's" process, and hope to be able to answer your other queries in an early number. The Almanack shall be sent.

W. H. H.—Cerolein is that constituent of bee's wax which is soluble in cold alcohol. It is a greasy body, to which the colour, odour, and tenacity of the wax are due. It constitutes about five per cent of the wax. Its solution in alcohol has been employed for preparing paper. The "Turpentine Waxed Paper" process, which we shall give in an early number, is an improvement on it.

Communications declined with thanks:—J. G.—X. A.—Thomas N.—Hypo.—A Subscriber.—J. C. C.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—An Enquirer.—T. Clark.—Ambrotype.—A Subscriber at Paisley.—J. T.—Photo.—Six.—W. W. W.—Stereo.—F. A. B.—C. E.—Pyro.—An Amateur.

In Type:—A. B.—Aggrieved Spirit.—H. T. T.—A Foreigner.—W. H. W.—W. G.—Iodide.—W. McC.—R. W.—G. W. H.—A Gilder.—E. D.—G. N. B.—C. F. B.—H. C. J.—J. C. S.—Sen. Sol.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

Vol. I., No. 13.—*December* 3, 1858.

THE COLLODIO-ALBUMEN PROCESS.

If this beautiful and very certain process were in danger of being buried and forgotten in the more recent discovery of Mr. Fothergill, the late report of the Manchester committee must at least induce those who have time and opportunity to try both, and draw their own inference as to the results. I have, myself, worked every process—if not every modification of every process, and my old faith is yet unaltered, that the *best results* of each are almost, if not utterly, indistinguishable, and two good photographers would be of different opinions as to the kind of negative from which some prints are taken. I know that many will differ from me. I will, however, mention one instance to support me, and that is, Leverett's waxed paper views, which were at the Exhibition of the Art Treasures last year. Generally this process has the least decision and sharpness of any, yet his "Stutton Park," and many others, were not less beautiful in *any way* than the very best glass pictures there. With this faith, the question of what process to use seems to me to appeal for its answer to *ease of preparation* and *certainty;* in the latter, at least, collodio-albumen cannot possibly be excelled, and if the preparation appears to be complicated, and to take a longer time, I think that, if we examine both, we should come to the conclusion that at least it is quite as *convenient* as Fothergill's, if not more so. Doubtless a thousand voices will be raised to contradict this statement; but they forget that *all* the preparation of Fothergill's must be begun and finished at once. Now in the other process a man, even after business hours, might prepare thirty or more plates as far as the first stage, and leave them in this state until dry, when they would keep any length of time; and then it is easy to prepare twenty for the camera, whilst another man using Fothergill's prepares five or six. Is not this an advantage that has ever been overlooked? I, myself, generally have sixty or eighty large plates ready for the last bath, and I have never found the last used any way inferior to the first. One advantage, and one only, I have observed in Fothergill's, and that is indisputable—the time of printing is slightly reduced, as the light is made less powerful by the albumen coating being rather thick in the other. As this description is intended for *beginners* as well as *photographers*, the latter must excuse the minuteness of the directions, which naturally range themselves as follows:—

1. The kind of glass, and how to clean it.
2. The collodion, and how to prepare the albumen.
3. How to apply both.
4. The bath, and application when preparing for the camera.
5. Exposure.
6. Developing the negative.
7. Fixing, washing, and varnishing.

1st.—The glass, and how to clean it, is the first stage of the operations; and here I must caution the operator against being persuaded to go to the expense of "patent plate," or other extravagant description of glass. I know the glass-trade *well*, and if a man asks for *good* "16 *ounce sheet*" at any respectable dealers, he will have a flat plate quite good enough for any description of negative, and the price is not one fourth of that which he must pay for "patent plate." The new sheets need no cleaning, but well washing with soda and water—of the strength of one ounce of common washing soda to about a quart of water; but if the plates have been used before, put any quantity of them in a vessel of *hot* water and soda of the same strength as above, leave them from one quarter of an hour to an hour, and then the film will readily come from the glass. After this, with a little bunch of linen, dipped first in a strong (say one part to four or five parts of water) solution of cyanide of potassium, and then in rotten-stone prepared for the use of the kitchen, rub the plate well, throw it into a large vessel of water, and when all are in this, well wash and wipe. I feel a little unwilling to recommend this mode, as it involves the use of the deadly poison cyanide of potassium; but as every man who photographs must necessarily use what we call dangerous chemicals, I can only caution the beginner. And this method involves less trouble, and is more certain than any other that I have ever tried. When used the plates must be perfectly dry, otherwise blisters, or the leaving of the film, are inevitable.

2nd.—Part of the process is the choice of collodion, and the preparation of the albumen. As to the collodion, I have tried but few makes; my experience is, that with many of the kinds sold as positive collodion it is utterly impossible to work, as they crack when dry, or the film leaves the glass in developing. Those prepared for the dry process alone should be used. I recommend no particular makers; I have never had but one blister out of many hundreds of large plates.

The albumen should be taken from as fresh eggs as can be procured. The germs being removed, it should be prepared as follows:—

Albumen	1 ounce (by measure).
Distilled water	¼ „ „ „
Liquor ammoniæ	10 minims.
Iodide of potassium	5 grains.
Bromide „	1 „

Dissolve these salts in the distilled water, and add to the solution a minute portion of iodine, so that it may have a decided yellow tone (this is advisable, as sometimes there is free potash in the iodide, which causes minute holes in the blacks of the finished picture); then add to the albumen, and beat well with a silver or wooden fork, or by any other of the numerous methods used. That which I find the simplest and perhaps the best method is, to take a handful of small gravel, very well washed, and to put it, with the albumen, &c., into a strong bottle, shaking it well for ten minutes or a quarter of an hour; by this means the albumen is beaten enough to flow easily. Let it stand twelve, or, if not wanted, twenty-four hours; then filter through fine muslin, and it is fit for use.

This will keep a long time. I have had it for months, and my pictures were as good with it as with the newly-mixed. *To keep*, however, it should be in a stoppered bottle with a lump of camphor floating on it; and when about to be used, it should be filtered through fine muslin as at first. The next stage is—

3rd.—To apply both, a plate-holder is indispensable—the *Globe Pneumatic holder* is decidedly the best and most easily used. In this place it is as well to describe the method of making the silver bath, as but one is used for both collodion and albumen:—

Nitrate of silver (pure)...	35 grains.
Glacial acetic acid	10 „ (or minims).
Distilled water	1 ounce.

To saturate this with iodide of silver, which must be done, the most ready method seems to me to be coating a plate with collodion and leaving it in the bath a few hours; it is then fit for use. Take up the plate with the "holder," and pour

into the centre a body of collodion, so that it may flow freely over the surface, and pour it off at the corner nearest you back into the bottle; then move the plate a little to and fro in order to erase the streaky look which it would otherwise have; let it set *well*, and lower into the bath without a stoppage, else a line, at that part, will be inevitably formed across the plate; leave it a minute; then lift up and down once or twice to wash away, as it were, the streaky appearance of the iodide surface, which will seem greasy; take out; let it drain a little into the bath, and then wash well. My method is as follows:—I have two or three large vessels of water, and put the plate in the first; whilst another plate is in the silver bath I remove the last plate from the first to the second; and if I use three (as I do for large plates), so into the third; then with a jug of water I wash the plate well; lay it to drain for a minute; wipe the back, just to take off the little spots and drops of water which settle there, and pour on and off, three times, the prepared albumen. I must also explain how I do this. Many operators say that, for my size of plates—$9\frac{1}{2} \times 7\frac{1}{2}$—an ounce of albumen must be used to each. Long ago it seemed to me, that the expense for a great quantity of large plates in albumen alone would be half as great as in collodion—as an ounce of collodion will coat three or four plates, 9×7, if not more; so I tried using, say two ounces of albumen for two plates; then in another vessel I put two ounces of fresh; and on each plate I poured, first, the used albumen, which carried off most of the water, and then I used the fresh quantity twice; so I did for five or six plates, and then I threw away the first used, and in its stead put the other two ounces, and poured out two from the unused albumen to use last again. By this means a great saving is effected, and the results, in my hands, are as good. Most operators, however, use fresh albumen each time—an ounce to each plate, 9×7 or 10×8. After this, the plate must rest on the corner, if possible, to dry, and should not be moved until it is dry, as this causes waves and uneven marks upon the surface. When quite dry—*and not before*—the plates are ready for,

4th—The bath, &c., when preparing for the camera. The same bath as before is used when exciting for the camera, but this part of the process may be deferred to an indefinite time *if the plates are kept dry*, and light does not affect them in this stage if they have been washed well. When, therefore, the plates are wanted for use, they must be again immersed in the bath for at least one minute, but not longer than two or three, and washed as before. Again they must be dried before using; as, if they are dried in part only, the development will be uneven and in dark patches; however, in a warm room they dry very readily, especially if we wipe off the wet from the back. When dry they are fit for the 5th stage—The exposure.

(*To be continued.*)

DRY COLLODION.

BY P. C. DUCHOCHOIS.

Every photographer knows how difficult it is to find a collodion suitable for the collodio-albumen, gelatine, or meta-gelatine processes, *i.e.*, a collodion giving a film neither tenacious nor contractible, but very porous, friable, and adherent. Old collodions are recommended as possessing such properties, but, besides that they are often too much iodised for that purpose, it is to be remarked that, if the collodions prepared with alkaline iodisers answer very well, those iodised with metallic salts (cadmium generally) do not always work as well, for although the collodion becomes coloured, the film keeps for a long time all the characters of the collodion one or two weeks old.

Believing, from observation, that the alkaline and metallic bases reacted on pyroxyline in different manners, desirous to explain that fact, and also to have a formula by which I can surely prepare good collodion for the dry process, I made the following experiment to study the action of alkaline bases in collodion:—

To a plain collodion giving a thick strong film, very contractible, and easily lifted up in long rays, I added liquid ammonia; immediately it was troubled, and, after a few hours, gave a thinner film, very porous, rotten, and opaque; it took twenty-four hours to clear up, became a fine amber colour, and left a white precipitate of decomposed pyroxyline (cellulose). Caustic potash and caustic baryta in small quantity acted nearly in the same way. Hence, alkaline bases react powerfully on pyroxyline, *it is disorganised, and a part is decomposed.*

This is very important. It explains—1st. The great fluidity of collodions prepared with alkaline iodisers (particularly when iodide of ammonium is used), and, partly, their instability. 2nd. Why those collodions give a film with less and less body, and the causes of the want of success resulting from it. 3rd. The advantage of alkaline collodion for Taupenot's and Norris's processes, and, generally, for all dry preparations on collodion. It will be observed that the amount of ammonia added to the plain collodion ought to be proportioned according to the kind of pyroxyline, that is, to the more or less tenacity or contractibility of the collodion, and that ammoniacal collodions cannot support as much iodiser as other ones—4 grains to the ounce is a good proportion for the collodio-gelatine process, and 2 grains are enough for the collodio-albumen.

But since it is easy to prepare a collodion with all the proper qualities for dry preparations, I have adopted a truly dry collodion process (without any kind of preservative coat) which is very sensitive, and has the advantage of great simplicity. The preparations are—

COLLODION.	
Ether concentrated	6 fluid drachms.
Alcohol 95°	2 " "
Pyroxyline	5 grains.
Iodide of ammonium	4 "
Liquor ammoniæ	3 drops.
SILVER BATH.	
Water	1 fluid ounce.
Nitrate of silver	27 grains.
Dilute acetic acid	2 drops.
DEVELOPER.	
Gallic acid	1 ounce.
Alcohol	4 "
Dilute acetic acid	1 drachm.
Camphor	15 grains.

After sensitising, immerse the plate in water for three or four minutes, and having washed it with distilled water, let it dry in the dark. To develop—first wet the collodion film with water, and then spread upon it a mixture of 1 drachm of the developer, and 3 or 4 ounces of water, afterwards add a small quantity of a solution of nitrate of silver, at 3 per cent., to strengthen the negative. Fix with hyposulphite of soda.

As it has been said, this process is very rapid, and the failures often arise from an excess of exposure; if it is too long, the sky does not blacken, the picture is too equal, and does not take enough intensity in the high lights.

BALLOON PHOTOGRAPHY.

Pending the reproduction of colours by means of photography, a mode of accomplishing which has been said to have been discovered five or six different times already, pending also the vulgarisation of the different economical printing processes guaranteeing their permanency, which are yet but in the condition of laboratory experiments, processes which shall advantageously replace, at a given moment, engraving and lithography,—novel experiments are rewarded by the most curious results. Not a very long time has elapsed since the English journals announced the *chef-d'œuvre* of photographic instantaneity—a shell taken in the air at

the moment of its explosion. Bird's-eye photography had not yet been attempted, although it is about to be. M. Nadar, who, by dint of care and ability, has succeeded in producing those magnificent proofs which have the appearance of Rembrandt etchings, made on Sunday a preparatory ascension in the Godard balloon, in which he studied the necessary conditions requisite to insure the success of this first attempt at what may literally be termed "bird's-eye" photography. . . . . M. Nadar proposes to make attempts alternately in free and captive balloons.

Balloons have been, as is known, employed for purposes of strategy during the wars in Germany, Belgium, and Egypt. Photography, hereafter aerostatic, may render great services in the taking of ground plans, hydrography, &c. There is no necessity for us to insist on the importance of this scientific event.—*Moniteur.*

STEEL-FACING COPPER PLATES.

SOCIETY OF ARTS.—*Wednesday, November* 24, 1858.—GEORGE T. DOO, Esq., R.A., F.R.S., in the chair.

THE following paper, and the discussion thereon, which we have quoted from our contemporary, "*The Journal of the Society of Arts*," appear of such importance to the photographic world, now that attention is being so strongly directed towards the obtaining photo-engravings on copper or other plates, that we have inserted it in as complete a form as the space at our disposal would admit.

The paper read was "On a method of rendering engraved copper-plates capable of producing a greatly-increased number of impressions. By F. JOUBERT."

After giving a historical account of the rise and progress of the art of engraving, the author proceeded:—

"The last century produced many engravers of great merit, and in this country foremost amongst them are Hogarth, Sir Robert Strange, and James Heath. The excellence of their works gave rise to such a demand for print impressions of engravings, that some forty years ago, when it was found that a copper plate could not yield a sufficient number of impressions for the demand, steel plates were introduced, for small plates only at first, and several editions of books were published containing plates most elaborately engraved on steel.

"Subsequently, when means were found to obtain a large surface of steel of pure quality, this metal was adopted for the style of engraving known as mezzotinto, which is now practised on steel plates, the result being a much larger number of impressions obtainable as compared with the old copper plates; but historical or line engraving for important subjects was still entirely practised on copper, when the discovery of the art of electrotyping took place, towards the year 1838.

"Several line engravings on copper were then multiplied by this process; the result, however, was only attended with partial success, in consequence of the soft quality of the copper so deposited, which will yield but a very limited number of good impressions, and soon wears away; this caused the process to be almost abandoned for artistic engraving, but for commercial purposes it is still practised extensively, and has been often successfully applied in cases where a large number of impressions is not required.

"Under the circumstances which I have described, it had become a desideratum to harden, if possible, the surface of a copper plate, and to protect it from wear while printing; but it is only lately that this important object has been attained.

"In March last, my friend M. Jacquin, of Paris, took out a patent in this country for a method of coating plates with iron, which had already been successfully applied in France, and of which the merit is due to my friend, M. Henri Garnier, of Paris.

"I have myself had the advantage of co-operating with M. Garnier in the development of the invention, the principles of which I shall now proceed to describe:—

"If the two wires of a galvanic battery be plunged separately into a solution of iron, having ammonia for its basis, the wire of the positive pole is immediately acted upon, while that of the negative pole receives a deposit of the metal of the solution—this is the principle of the process which we have named 'acierage.'

"The operation takes place in this way: By placing at the positive pole a plate or sheet of iron, and immersing it in a proper iron solution, the metal will be dissolved under the action of the battery, and will form hydrochlorate of iron, which, being combined with the hydrochlorate of ammonia of the solution, will become a bichloride of ammonia and iron; if a copper plate be placed at the opposite pole and likewise immersed, the solution being properly saturated, a deposit of iron, bright and perfectly smooth, is thrown upon the copper-plate, from this principle:—

"Water being composed of hydrogen and oxygen;

"Sal ammoniac being composed of

"1st. Hydrochloric acid containing chlorine and hydrogen;

"2nd. Ammonia, containing hydrogen, nitrogen, and oxygen;

"The water is decomposed under the galvanic action, and the oxygen fixes itself on the iron plate, forming an oxide of iron; the hydrochloric acid of the solution acting upon this oxide forms a hydrochlorate of iron, whilst the hydrogen precipitates itself upon the plate of the negative pole, and, unable to combine with it, comes up to the surface of the solution in bubbles.

"My invention has for its object certain means of preparing printing surfaces, whether for intaglio or surface printing, so as to give them the property of yielding a considerably greater number of impressions than they are capable of doing in their ordinary or natural state. And the invention consists in covering the printing surfaces, whether intaglio or relief, and whether of copper or other soft metal, with a very thin and uniform coating of iron, by means of electro-metallurgical processes. The invention is applicable whether the device to be printed from be produced by engraving by hand, or by machinery, or by chemical means, and whether the surface printed from be the original or an electrotype surface produced therefrom. I would remark that I am aware that it has been before proposed to coat type and stereotypes with a coating of copper, to enable their surfaces to print a larger number of impressions than they otherwise would do; I therefore lay no claim to the general application of a coating of harder metal on to the surface of a soft one, but my claim to invention is confined to the application of a coating of iron by means of electricity on to copper and other metallic printing surfaces.

"In carrying out the invention the solutions of iron employed may be varied, and such is the case in respect to the arrangement of the galvanic battery or other source of electric currents used; I do not therefore limit the invention to the means hereinafter described, but I believe they will be found to be the best for the purpose.

"I would further remark that it is important that a ferric solution should be employed which will not dissolve or corrode the plate intended to be coated, for if it be attempted to use such a solution, though the iron will be precipitated, it will not only be in a non-coherent state, but the engraved surface itself will be liable to be attacked and injured. It may also be remarked that the coating of iron admits of being removed from a printing surface of copper without injury to the original plate, hence the original plate may, after being coated and used for some time, have the worn coating removed, and then be recovered with an iron coating as often as may be required; and if care is taken to remove the coating of iron before it has been entirely worn away, the engraved copper or other plate may be made to print a vast number of impressions and yet remain in the original state it was in when it left the hands of the engraver, or was otherwise first produced; the only limit appears to be in the gradual change which takes place in the body of the printing surface by the compression to which it is subjected in the process of printing. Heretofore, in respect to plates engraved in intaglio, if of steel, they each yield on the average about 3,000 impressions without retouching; if of copper they each yield on an average not more than 800 without retouching; whilst electro casts of copper obtained from the originals will not on an average each yield even 200 impressions without retouching; in fact, such printing surfaces are so easily worn, that after the first 100 or 150 impressions there is a considerable deterioration in the quality of the work produced. Therefore, for the supply of the number of impressions often required by art associations and others, it has been found necessary to multiply the electro casts very con-

siderably. In such cases the invention is applicable with considerable advantage, for I find that an electro plate 40×22 inches covered or coated with iron has yielded 2,000 impressions without its being necessary to remove and renew the iron coating, there being no perceptible difference between the first and last impression, the work on the plate appearing not to have suffered in the slightest degree. Hence in future, by the application of the invention, it will only be necessary to multiply electro casts to such an extent as may be necessary to ensure the production of prints or impressions with the requisite speed on paper, calico, or other fabrics. At the same time an original engraving on copper would become, when treated according to the invention, more lasting than if engraved on steel. Although original surfaces engraved in relief, and also electro and other casts taken from them, yield a considerably greater number of impressions than those I have mentioned as obtained from plates engraved in intaglio, to which the invention has not been applied, nevertheless the invention is applicable with great advantage to such relief printing surfaces, whether of copper or other soft metal, for if they be coated with iron, according to the invention, they will yield almost an indefinite number of impressions, provided the iron surface be renewed as often as may be necessary, and the printing surfaces be again re-coated.

"In carrying out the invention, I prefer to use that modification of Grove's battery known as Bunsen's, and I do so because it is desirable to have what is called an intensity arrangement. The trough I use for containing the solution of iron in which the engraved printing surface is to be immersed in order to be coated is lined with gutta percha, and it is 45 inches long, 22 inches wide, and 32 inches deep. In proceeding to prepare for work, the trough, whether of the size above mentioned or otherwise, is filled with water in combination with hydrochlorate of ammonia (sal ammoniac) in the proportion of one thousand pounds by weight of water to one hundred pounds of hydrochlorate of ammonia. A plate of sheet iron, nearly as long and as deep as the trough, is attached to the positive pole of the battery, and immersed in the solution. Another plate of sheet iron, about half the size of the other, is attached to the negative pole of the battery, and immersed in the solution; and, when the solution has arrived at the proper condition, which will require several days, the plate of iron attached to the negative pole is removed, and the printing surface to be coated is attached to such pole, and then immersed in the bath till the required coating of iron is obtained thereto. If, on immersing the copper plate in the solution, it be not immediately coated with a bright coating of iron all over, the bath is not in a proper condition, and the copper plate is to be removed, and the iron plate attached and returned into the solution. The time occupied in obtaining a proper coating of iron to a printing surface varies from a variety of causes, but a workman, after some experience and by careful attention, will readily know when to remove the plate from the solution; and it is desirable to state that a copper plate should not be allowed to remain in the bath and attached to the negative pole of the battery after the bright coating of iron begins to show a blackish appearance at the edges. Immediately on taking a copper plate from the bath, great care is to be observed in washing off the solution from all parts, and this I believe may be most conveniently done by causing jets of water forcibly to strike against all parts of the surface. The plate is then dried, and washed with spirits of turpentine, when it is ready for being printed from in the ordinary manner.

"If an engraved copper plate be prepared by this process, instead of a comparatively limited number of impressions being obtained and the plate wearing out gradually, a very large number can be printed off without any sign of wear in the plate, the iron coating protecting it effectually; the operation of coating can be repeated as many times as required, so that an almost unlimited number of impressions can be obtained from one plate, and that a copper one.

"This process will be found extremely valuable for electrotype plates, and also for photogalvanic plates, since they can be so protected as to acquire the durability of steel, and more so, for a steel plate will require repairing from time to time, these will not, but simply re-coating whenever it is found necessary; by these means one electro copper plate has yielded more than 12,000 impressions, and was found quite unimpaired when examined minutely.

"It is easy to appreciate the importance of this invention, as applied to artistic or line engraving more especially, for a copper plate, being once engraved, if submitted to the acierage process, will become a lasting property, not liable to deterioration by printing, and the public may expect to be supplied with the very best impressions at a more moderate charge, whilst to the numerous branches of commercial engraving, for the ceramic manufactures and others, as well as to the vast number of old engraved copper plates existing in this country, this process is likely to confer an immense additional value.

"I need not say that copper is by no means the only metal to which the process is applicable, for the same principle will be found to answer in the case of other soft metals used for printing purposes; and I shall only add, in conclusion, that although the principle of electrotyping has been applied up to the present date in a variety of ways, since it was organised by Thomas Spencer, in 1837, this is, I believe, the first time that an attempt has been successfully made to prepare an engraved copper plate with harder metal, with the view of increasing its printing capabilities, and I feel happy to have been the first to introduce so valuable a discovery into this, my adopted country."

DISCUSSION.

Mr. George Godwin, F.R.S., had listened with great pleasure to Mr. Joubert's paper, as, no doubt, all present had done. Passing to the more practical points of the paper, he would remark, in the first place, that he thought it ought not to be inferred that steel was only used in the present day for small plates. He believed it was also extensively used for large engravings, although the engraver would probably be glad to get rid of this metal, and return to the use of the softer material, copper, if a sufficiently large number of impressions could be taken from it, and this was the great point to be considered in estimating the value of the invention before them. He did not think Mr. Joubert was quite right in attributing the failure of the electrotype process to the softness of the electrotype plates. It was stated by Mr. M'Queen, in his evidence before a Committee of the House of Commons, that the electrotype plates gave as many impressions as the original copper plate itself. The Council of the Art Union of London had adopted the electrotype process at a very early period of its introduction, and, in some cases, with perfect success. For instance, in the case of the plate of "Raphael and the Fornarina," engraved by Lumb Stocks, there were fourteen electrotype plates taken from it, which produced 14,000 successful impressions. He believed 1,100 impressions was the maximum taken from any one of these electrotype plates, which was a very large number; it was true that some touching of the plates was required. He believed that was as large a number as could be taken from the original plate. The point he wished more particularly to dwell upon was this, that the softness of the plate was not the cause of failure, but, in producing the original, there was frequently a considerable amount of under-cutting, where the line was wider at the bottom than at the top, so that, when the matrix was removed from the plate, there was a certain amount of tearing off from the surface, and he believed it was that circumstance chiefly which had led to the idea that the electrotype process was a failure. They would see that, inasmuch as Mr. Joubert's process started with the use of electrotype plates, it was necessary that the inconvenience in that process which he had pointed out should be understood, in order that it might be guarded against. He feared, looking to the process exhibited that evening, that if the plates were suffered to remain too long in the bath there was danger of the finer lines of the plate becoming partially filled up. He thought a good test would be to take an impression from a plate just out of the hands of the engraver, and before being coated by this process, and also an impression from it after having been coated with iron.

Mr. Joubert remarked that he had been misunderstood if, as stated by the last speaker, he had represented that his process was more particularly intended to be applied to the electrotype plate on account of its softness. It was equally suitable for the original plate; and, as an example, he might state that the original plate of the engraving behind him (The Playground) had been coated by this process six months ago, and from it he believed 5,000 impressions could now be taken without its being necessary to renew the coating. With regard to the remark that the electrotype plates would yield as many impressions as the original plate, he begged to say that he had with him two impressions of an engraving which went to prove that this was

not the case. Referring again to the engraving exhibited, which belonged to the Art-Union of Glasgow, the impression they saw was the artist's proof from the original plate just after the engraving was completed, and here [producing another copy] was an impression taken from the electrotype plate coated by his process. The impression he exhibited was taken when there had been 2,300 printed off, and, when examined, he did not think that any real difference would be perceived between that impression and the artist's proof. Here [producing another copy of the same engraving] was a bad impression from the electrotype plate not coated, which began to fail after 240 impressions, and completely failed after 400. It was true that electro deposits were better than others, but he believed that, on the average, the number at which the electrotype plates began to fail was from 250 to 300, whilst from the original plate of beaten copper as many as 800 impressions might be taken without "touching."

Mr. GODWIN said he had merely stated the fact as it occurred; that, in the case of the plate he had referred to, 1,100 copies were taken from the electrotype plate. It was true that frequent "touching" was found necessary.

Mr. JOUBERT believed his professional brethren present would bear him out that if, in the instance alluded to, as many impressions were taken from the electrotype plates as from the original plate, it was a very remarkable case. He had known so many "touchings" to be given to a plate that scarcely a particle of the original work remained.

Mr. M'QUEEN could confirm the statement of Mr. Godwin with regard to the engraving alluded to, namely, that the electrotypes yielded as many impressions as the original plate.

Mr. JOUBERT added that Mr. Godwin was quite correct in stating that one of the chief drawbacks of the process of electrotyping was when under-cutting occurred in the original plate; but when a plate was engraved with a view of being electrotyped, it was easy for the engraver to avoid under cutting and to secure a good matrix being taken from the plate without tearing off any of the lines.

Mr. VARLEY expressed a high opinion of the value of this invention.

Mr. JOUBERT said, that Mr. Godwin seemed to fear that there was danger of the fine lines of an engraving being filled up by the process of metallic coating. By way of experiment, he had tried to deposit a very thick layer of metal upon a plate, without regard to the filling-up of the lines, and he found that it was hardly possible to fill them up.

The Rev. WALTER MITCHELL begged to inquire how far this invention had been tried commercially, and with what results?

Mr. JOUBERT admitted the importance of the question just put to him, to which he thought he could not give a better answer than was afforded by a letter which he received two days ago from Mr. Henry Bohn; the well-known publisher, of York-street. Mr. Joubert then quoted from the letter, which stated that no one was more alive than the writer to the value of this discovery. Although he had urged on experimentalists to find out some means of hardening copper-plates, he had never anticipated such success as had been achieved by this process. He had had several of his old copper-plates coated, and was gratified to find that the operation had been entirely successful, reproducing the engraving without any loss of the original delicacy, and yielding a large number of impressions. He (Mr. Bohn) was now testing it upon plates which, but for this process, would be worthless.

Mr. J. JENKINS inquired whether this process had been as yet applied to the engraved plates for porcelain.

Mr. JOUBERT replied that at the present moment it was being applied with success by one of the largest firms in Staffordshire. He had coated one plate about six weeks ago, and he had received an intimation that the experiment had been so far successful that another plate would be sent to undergo the same process previous to its being printed from.

Mr. JENKINS added that his reason for asking the question was because some years ago it was considered desirable by the pottery manufacturers to supersede the necessity of having a large number of copper plates engraved with the same design. At that time he suggested the use of steel plates instead of copper; but it was found that they were obliged to cut the lines so deep, in order to hold the large amount of colouring matter necessary, that there was great difficulty in using this hard metal. A further objection to the use of steel plates in that class of manufacture was that the smoothness of the surface prevented them from holding the oily description of colouring matter used. In the ordinary mode of printing, the cleaning of the surface of the plate was performed by the hand, but in pottery work the plate was scraped with a spatula, and by that process the oily ink was apt to be dragged out of the lines. He thought the objection he had alluded to might be obviated by merely coating the surface of the plate with steel, not penetrating to the incised parts of the plate. The incisions would then remain copper, which would retain the coloured printing material, whilst the portion exposed to the friction of cleaning would be coated with steel.

Mr. JOUBERT said the objection to coating the surface of the plate would be that the spatula would just catch the engraved lines, which, not being protected, would become worn. This was one of the objects of coating not only the surface of the plate, but the incised parts also. The same remark applied to ordinary copper-plate printing, as well as to the class of work alluded to by Mr. Jenkins.

Mr. BLACKWOOD inquired whether the process had been applied to ordinary printing types and stereotype plates?

Mr. JOUBERT replied that several plans had been tried for coating types with other metals—such as copper; but as it was known that ordinary printing type would endure a very large amount of wear, it was thought that there was no absolute necessity for applying this process. Stereotype plates also yielded a large number of impressions, and if they became worn out another set of plates could be made at a small expense. The process, however, was capable of application to type-metal, as to any other description of metal.

Mr. LE KEUX was aware that for pottery work there was some difficulty in using steel plates. In a mercantile point of view, therefore, he had no doubt that this process could be brought into extensive use, not only in the potteries, but also in Manchester, where copper printing cylinders were so much used; but he thought in the higher branches of engraving, except in the illustration of historical works, although artists would lose nothing by this invention, they would be slow to adopt it until it had been put to some more severe tests than he had heard of. The experiments, as far as they had at present been carried, appeared to have been made with old plates, which had, as it were, been re-surfaced. With reference to the remarks of Mr. Godwin, relative to the failure of electrotype plates owing to the under-cutting, he begged to say that this was a mistake. Many engravers present would bear him out that the beauty of a finished plate, the tone, the air, and the finish, was got by the burnisher, and the under-cutting alluded to was not produced by the graver, but by the action of the burnisher.

Mr. GODWIN said he simply stated that the under-cutting existed, which had the effect upon the electrotype plates that he had mentioned.

Mr. LE KEUX continued:—This process was an addition to the surface as well as to the lines of the plate, and he repeated that he was anxious to see it put to a severe test. For mercantile purposes probably 99 persons out of 100 would not know the difference between an impression from the original plate and one from the coated plate; but he wished to see the experiment tried with a plate of high character, and that the results should be submitted to really competent judges. If this test then showed that the process neither robbed the whites nor the blacks, nor filled up the interstices, it might be considered satisfactory. He had not heard that the experiment had been tried to any extent with high-class plates. It might be that persons hesitated to expose plates of such high value to the risk of coating, but he could easily understand that those who had a stock of old plates on hand, from which scarcely a hundred impressions could be taken, would be very glad to subject them to a process which would enable them to print off thousands.

Mr. JOUBERT said he was most anxious to have the opportunity of testing his process upon a plate fresh from the hands of the engraver. As yet he had not tried the experiment upon fresh plates, except upon some of his own, which had been engraved about 12 years ago, and from which only a few impressions had been taken. In the case of these experiments, he, in the first instance, took an impression from the original plates, after which he submitted them to the process of coating, and took another impression. These two impressions were afterwards shown to his friend the chairman, who would, no

doubt, kindly state what had occurred with reference to them.

The CHAIRMAN said, this being a very important question as far as Mr. Joubert was concerned, he might be permitted to say that the proof which he had selected as being the impression from the original plate, and which he judged to be the best, turned out to have been taken from the coated plate, so that, if there was any difference at all, the palm of excellence was, in that instance, on the side of the latter.

Mr. WILLIAM HUMPHREYS remarked, that a previous speaker had referred to the facility with which colouring matter was removed from the plates used in printing for pottery purposes. In ordinary copper-plate printing, a very viscid quality of ink was used, and he recollected the difficulties experienced in the early stages of steel-plate printing on that account, but, by the adoption of a suitable ink, the one description of plate was now worked as easily as the other. The great advantage of Mr. Joubert's process he conceived to be this—that, the plate having a steel surface, the ink could be wiped from it previous to printing, with a less amount of friction than was the case with copper-plate, which held the ink more tenaciously, whilst undoubtedly a greater number of impressions could be obtained from a plate treated by this process.

Mr. WINKWORTH would be glad to have the further confirmation of so high an authority as that of the chairman upon the point mentioned by Mr. Joubert, viz., that the impression taken from the coated plate was, in all respects, equal to that taken from the original plate.

The CHAIRMAN said he could easily satisfy Mr. Winkworth upon that point. He understood the capabilities of Mr. Joubert's invention to be this—that an impression might be taken from a copper plate in whatever condition it might be, whether direct from the hands of the engraver, or after a number of impressions had been taken; it might then be coated with the steel and another impression might be taken, and he understood Mr. Joubert to state that the impression would be identically the same in appearance. As to this being the fact, he could only repeat what he had already stated, viz., that in two specimens that were submitted to him, he selected as the better impression of the two that which had been taken from the steel-coated plate. It undoubtedly was the better of the two, although this might have arisen from some accidental circumstance.

Mr. YATES suggested that a satisfactory test could be afforded by printing with a portion of the plate uncoated. It would then be seen on which side the advantage lay.

Mr. JOUBERT said that experiment was about to be tried in the course of a few days by Mr. Virtue.

Mr. WINKWORTH had been requested to ask one other question, viz., whether the recently-published engraving of the execution of Lady Jane Grey, after Paul Delaroche, had been worked from a plate which had been subjected to Mr. Joubert's process, and whether the greater number of impressions had not been printed from the coated plate.

Mr. JOUBERT replied that the engraving alluded to had been a considerable number of years in hand. It was the work of an Italian artist, who began it 25 years ago, and though not constantly engaged upon it, worked at it for many years. The result was, that when the plate was finished, owing to the long time occupied upon it, either from the friction of the sleeve or the hand of the artist, the plate was very much worn, and a well-known printer in Paris, to whom the execution of the work was entrusted by the publisher who had purchased the plate, made the startling announcement that he could not produce more than 75 or 80 impressions from it. That was a most serious matter with regard to an engraving that had cost between £3,000 and £4,000, as the publisher could put no price upon the impressions to repay him for his outlay. The consequence was that the plate was electrotyped. Four plates were successfully taken, and from those the publisher intended to print the limited number of 300 copies, upon which a price would be put to repay him for the cost of the engraving. Having, however, heard of this process, he called upon M. Garnier, the inventor, and asked him to undertake an experiment with his plate. At that time the process had not been tried upon any plate of consequence, and M. Garnier felt a little nervous about it. He was, however, prevailed upon to try it upon the four electrotypes. Impressions were taken before and after the coating, which were submitted to the principal engravers in Paris, who pronounced the experiment entirely successful—they, in fact, said they could detect no difference between the two.

The CHAIRMAN said it was now his agreeable duty to propose a vote of thanks to Mr. Joubert for the paper he had read, and he thought the frank, truthful, and, he might add, understating spirit which had characterised all that he had said, entitled him to their respect as well as to their thanks. With regard to this, he must call it, important process, he thought it might be considered one of the great discoveries of the age. Very analogous to this was the discovery made a few years ago, also in Paris, of a material for indurating stone, which had since been extensively carried out; and he believed that architects might now defy the efforts of the elements and of time upon their structures. With regard to Mr. Joubert's process, the point which had principally occupied their attention was its capability of producing impressions from the coated plates equal to those from the uncoated plates, and on this he (the Chairman) had given his opinion. The other important point was, the durability which it imparted to the plates, and the quality it gave of multiplying copies to a considerable extent. But the pretensions of the discovery were yet greater; in fact, he saw no limit whatever to the working of plates when subject to this process. As soon as one coating exhibited symptoms of wear, it could be removed, and another coating put on; and, inasmuch as the printer could detect the slightest tendency to failure, the work could be stopped at any time, and thus the plate would be kept in a condition to produce impressions equal to proofs throughout the entire publication. If he was correct in what he had stated —and, so far as his knowledge enabled him to judge, he was so— he was sure he need only to invite them to accord their thanks to Mr. Joubert, for having brought before them so important and so valuable an addition to the scientific discoveries of the present age.

A vote of thanks was passed to Mr. Joubert.

Photographic Chemistry.

AIR AND WATER.

Air and water are two compounds of such importance in chemistry, that we consider it necessary to devote some columns to a consideration of their qualities. In the opinion of the ancients, air, water, earth, and fire were the elements of all bodies of whatever nature they might be: we now know air to be a mixture of two gases, nitrogen and oxygen; and water to be a combination, in equivalent proportions, of hydrogen and oxygen.

Air.—The composition of atmospheric air has been perfectly known a very long time: we have already stated that it is composed of nitrogen and oxygen, and the proportions in which these two gases unite to form air is, as nearly as possible, four of the former to one of the latter. The manner in which this may be ascertained is, by boiling mercury in a closed vessel for a considerable period, when it will absorb the oxygen, and become converted into a red, scaly oxide. The quantity of air which remains in the vessel being ascertained, and the oxide of mercury being heated until restored to its original condition, the amount of oxygen given off will be found to be one fourth of that contained in the first vessel.

Besides oxygen and nitrogen, air always contains a small quantity of carbonic acid, the product of combustion and respiration, as well as vapour of water, arising from the continual evaporation of the water spread over the surface of the globe; the quantity of this vapour differing, of course, according to the nature of the locality, the direction of the winds, the season, and the temperature of the atmosphere: it is owing to this facility which air possesses of charging itself with vapour, that the wet papers give off their moisture in dry air; and this vapour, when the air is very humid, becoming condensed on the object glass, may obscure the image in the camera.

The quantity of oxygen contained in the air determines the rapidity of combustion, which may be either slow or active, according to the nature of the combustible. In the

case of iron, for example, the metal can only be melted by an intense furnace heat; but if an iron wire, to one end of which a bit of burning candle-wick is attached, be introduced in a glass jar of oxygen, the iron will be seen to burn like a thread of flax.

Water.—There are bodies which are termed *combustibles*, and others which are termed *supporters of combustion;* for example, water, which is the body we have next to examine, is a compound of a combustible and an incombustible body, viz., oxygen and hydrogen. The former gas, as we have already pointed out, increases the intensity of combustion to its highest point, yet it cannot itself be made to burn; whereas the latter gas, hydrogen, so far from supporting combustion, would immediately extinguish a lighted taper immersed in it, and yet is susceptible of ignition, and burns with the emission of intense heat though little brilliancy. It may appear surprising that the body to which we resort to extinguish fire should be composed of two substances, the one exceedingly inflammable, and the other such an active supporter of combustion; yet that this is so can be easily demonstrated by various experiments, such, for instance, as the passing of steam through a gun-barrel containing pieces of iron, the whole of which is maintained at a red heat, and the gas passing through received in a bladder at the opposite end. It will be found at the termination of the experiment that the pieces of iron are converted into an oxide, and the gas in the bladder to be far lighter than the same bulk of common air, and to possess the qualities we have indicated as belonging to hydrogen, which in fact it is. There is a much more simple and easy way of testing the composition of water than the above, which consists simply in plunging into a vessel containing water the two conducting wires of a voltaic pile, and inverting over the poles two bell glasses full of water. If a somewhat intense electric current be now passed through the water it will be decomposed, the oxygen flying off from the negative pole, and the hydrogen from the positive pole.

(To be continued.)

Dictionary of Photography.

ACTINOMETER (*continued.*)—Mr. Hunt afterwards constructed an instrument on the same principles as those mentioned above; it was used for some considerable time, but it was placed at the Kew observatory and lay there neglected. The same gentleman has since constructed another instrument of which, as it seems to possess several good points for an instrument of this kind, we give the following description in his own words, he having read a description of it, some time ago, before a scientific society, which was afterwards published in their *Transactions*:—

"This actinograph consists of two brass cylinders moving freely upon their axes, one of them containing a powerful clock-spring, by which the apparatus is driven. These cylinders are fixed about twelve inches apart, and around them is placed a band of indian-rubber cloth, which being carried round by the friction against the upper working barrel, makes a complete revolution in twenty-four hours. The uniform rate of motion is secured by an ordinary clock escapement and pendulum. This apparatus is adjusted at such an angle that the direct radiations from a zone of the heavens, about 45° above the visible horizon, may fall upon its upper surface. This clock-work is, therefore, inclosed in a box, and covered with a brass plate, in which there is a triangular opening. The widest part of this opening measures one inch, and the smallest the sixtieth part of an inch. This is divided, 1st, into five holes of such sizes relatively as represent the periods of 1, 2, 3, 4, and 5 minutes; and 2ndly, by bars, the openings between each being adjusted to regularly increasing divisions, from 10 to 60. From this it will be understood that any point of the moving band will be exposed to the daylight for an hour in passing under the largest opening, and the time of exposure diminished by ten minutes in each of the other divisions until the smaller ones. In these the times of exposure are, under the largest hole five minutes, and under the smallest one minute.

"If we attach to the moving web a piece of prepared photographic paper, it will be evident that for the whole of daylight it will be receiving impressions during the time of exposure above described. The line which passes under the smallest hole will never be exposed for more than a minute, while that which moves under the largest opening will never be exposed for less than an hour; consequently we have the difference between 1 and 60. Now the maximum effect will be the blackening of the paper thoroughly in one minute, when of course the image of the opening and its divisions will be deeply impressed: the minimum effect will be, that the exposure of an hour is necessary to produce any sensible change in the colour of the paper; then we shall have the line under the longest opening alone well defined, the others becoming less and less distinct, until the paper remains absolutely white over those parts which correspond with the diminished openings. It is my intention to fix a numerical value to each of these, which will enable me to tabulate my results, and register the relative value of the actinic radiations by the side of the indications of the barometer, thermometer, and hygrometer. I wish to these the photometer could be added, but at present we possess no self-registering instrument which will give us indications of the variations in solar light. . . . .

"In the use of this instrument I prefer presenting it to the light of the northern sky rather than to the direct rays of the sun. In the latter case every passing cloud which obscured the face of the sun would be registered, but I believe the most accurate registration of the quantity of the chemical radiations active during daylight, will be more correctly determined by obtaining constant comparative results from the same point of the northern sky. The material with which I prepare my paper is a standard solution of the oxide of silver in ammonia. One wash only is applied to the paper, which is then found to be sufficiently sensitive for all the purposes of the instrument.

"A solution of that kind, kept in my bottle, remains constant for any length of time. After one single wash of this, the paper is placed damp in the instrument, and exposed during the hours of night; it dries, and in the morning it is in a uniform condition, which will last during the day."

(To be continued.)

A Catechism of Photography.

WAXED PAPER PROCESS—(*continued.*)

Q. What is the best method of preparing the paper for the waxed paper process?

A. The best, simplest, and most rapid process of waxing the paper is as follows:—Procure an iron plate, about a quarter of an inch in thickness, and a little larger than the paper to be used; place this plate over a furnace heated with charcoal, and keep it at a regular temperature; upon this plate then place one or two sheets of clean paper, on which arrange your paper for waxing.

Q. What sort of wax should be employed?

A. Either white or yellow wax will answer; but white, being the purest, is generally used in preference to yellow.

Q. How is the wax to be applied to the paper?

A. A piece of fine white wax is passed to and fro upon it until the surface of the paper is completely impregnated. Another sheet of paper is then laid on and waxed in a similar manner; a third and a fourth, even up to ten, may be added. They must then be separated, and each piece be placed between folds of blotting paper, and an ordinary iron, moderately hot, be passed over them.

Q. Wherein does the necessity exist for the further application?

A. The waxed paper being placed between blotting paper, the additional heat is applied for the purpose of removing any excess of wax which it may have taken, and which is, by this means, absorbed by the blotting paper.

Q. What is the advantage obtained by this waxing process?

A. The chief advantage of the wax in this operation is, not solely that it gives greater force to the picture than by the ordinary process, but that it gives additional transparency to the paper, and by impregnating its texture renders the subsequent operations far more complete than would otherwise be the case, and consequently makes the paper retain its sensitive properties for a considerable period.

Q. The paper having been waxed, what is the next operation?

A. A solution is prepared in the following proportions:—Sugar of milk, 620 grains; iodide of potassium, 225 grains; cyanide of potassium, 12 grains; fluoride of potassium, 7 grains, in about a pint and a half of rice water. The cyanide and fluoride of potassium may be substituted by about 45 grains of bromide of potassium.

Q. Will this solution keep for any length of time?

A. It will keep perfectly good for a considerable time.

Q. How is the solution applied to the waxed paper?

A. Some of the solution is poured into a bath or earthenware dish, and the waxed paper is plunged into it sheet by sheet, one over the other, great care being taken to remove any air bubbles which may arise. The sheets may remain in the bath from half an hour to two hours, until they have thoroughly absorbed the solution. The whole mass should then be turned over, and the first sheet removed and hung up to dry. It may easily be attached to a line by means of a pin at one corner; the drop on the lower angle should be removed by touching it with blotting paper.

Q. What is the next operation?

A. The paper, prepared as already stated, may either be employed at once or preserved for future use.

Q. Is it, then, in this state, ready for the camera?

A. No, it has to pass through a third process before it is capable of receiving a photographic impression.

Q. What is the third process?

A. A solution has to be prepared as follows:—Distilled water, 1 pint; crystallised nitrate of silver, 665 grains; crystallised acetic acid, 760 grains.

Q. How is this solution applied to the paper?

A. Three baths of glass or earthenware should be placed near each other. Great care must be taken that these vessels are chemically clean. A portion of the last solution must be filtered into one of these baths; in the other two should be pure distilled water. A packet of thick blotting paper is also required. These preparations being made, take a number of sheets of the waxed paper, and proceed thus:—Take the first sheet, and carefully place it upon the aceto-nitrate bath, taking great care that no air bubbles interpose. Allow it to remain in contact with the fluid until chemical combination is effected.

Q. What is the general time taken to effect this combination?

A. Eight or ten seconds are sufficient for some kinds of paper, and four or five minutes are required for others. When a violet tint appears the paper should be removed. It must be immediately removed; immersed in the distilled water (No. 1); thoroughly washed, and then removed to distilled water (No. 2); after which it should be dried, or partially dried, by the blotting paper.

Q. Must the sensitive paper be used immediately?

A. When it is desired to keep the paper for some time before using, it is recommended that the application of the nitrate of silver be less than on other occasions. It will thus be seen, that the papers which are prepared for keeping are not those which are the most sensitive; hence it is necessary to expose them for a much longer period to the action of the light than those prepared by a stronger solution of silver.

Q. How is the image taken in the camera developed?

A. By a solution of gallic acid in distilled water, in the following proportions:—Gallic acid, 6 grains; distilled water, 4 ounces; and a few drops of the silver bath. The paper should be immersed in this solution, and allowed to remain in it until the picture is fully developed.

(To be continued.)

Correspondence.

THE COUNCIL OF THE PHOTOGRAPHIC SOCIETY AND THE "PHOTOGRAPHIC NEWS."

Our thanks are due to the following gentlemen who have so promptly and decidedly favoured us with their opinions on the above point:—C. E. D.—A Member.—J. S.—G. W.—W. L.—J. B. D.—C. O. R.—M. P.—A. B.—A Photographer who seeks the extension of his Art.—G. S.—Carbon.—An *Ex.*-Member of the Council.—An Old-woman Hater.—Right is Might. Although our thanks are due to all, we have only been able to select the two following letters, which embody the opinions of the remainder. Our space would be insufficient for the insertion of all; and indeed, whilst we are grateful for the writers' sympathy, some of them advocate opinions too extreme for us to feel justified in giving them the publicity of our columns. We have many warm friends on the Council, and we are sure that they will not be slow to see the ridiculous position in which this obnoxious resolution has placed the Society. That it has been concocted by a small minority is our firm opinion, and we would leave it to the good sense of the whole body to rectify a blunder which is equivalent to an attack upon the privileges of the entire press of England.

To the Editor of "The Photographic News."

Sir,—As I rarely open my copy of the publication to which my subscription entitles me, unless when it contains a report of a meeting, I should have remained in ignorance of the "resolution" adopted by our Council had not my attention been called to it by the article in the "Photographic News." My first feeling, I confess, was one of incredulity; I found it difficult even to imagine that our Council could have committed such a blunder, not to give it a worse name. If their object was to bolster up the circulation of the Society's organ, they could not have adopted a worse plan for furthering that object; since a comparison with the "Photographic News" would inevitably lead to a discontinuance of the subscription to the journal unless the subscriber were, to a certain extent, interested in its maintenance; and, as you may fairly enough inquire, if that was not their object—what was?

I have read the article containing the resolution over and over again. I have pondered over it, with the view of ascertaining its meaning, as deeply as if it were one of Mr. Shadbolt's speeches, and I were bound, as a punishment for my transgressions, to find out the meaning for it; and I am forced to acknowledge—though I confess I do so with reluctance—that I can find no other explanation of the motives of the Council than that which you have suggested, viz., "a desire to impede the increasing circulation of the 'Photographic News.'" Having assisted in electing the Council, I would willingly disbelieve that its members could have been actuated by any such paltry motive; but the complete manner in which you have demolished the reasons alleged by the Council, leaves me no alternative than to admit that the men whom I supposed incapable of being influenced by any except the most honourable motives, have descended to a species of petty warfare which, if carried any further, must inevitably lead to the dissolution of the Photographic Society, as at present constituted. For my own part, I will never consent to any interference with the utmost liberty of the press; and if the "Photographic News" sees fit to publish any remarks I may offer at any of our meetings, I shall esteem it an honour; and in the event of my having occasion to read a paper, I will freely place a copy of it at your service; and that which I am prepared to do, I have no doubt every one of my fellow-members, with, perhaps, one or two exceptions, are prepared to do likewise. The welfare of the

Society is, of course, dear to me; but if it is to act as a bushel to diminish our individual light, then—why, then the sooner it is itself extinguished the better. Those among us who may happen to be gifted with a fair proportion of brains, cannot afford to have their labours confined to the knowledge of a "select few." What we want is the greatest publicity, and it signifies little to us how this publicity is obtained, provided it *is* obtained. I entirely agree with you that a man is not fairly rewarded for months or years of labour if the result of his labours is to be "entombed" in the columns of the Council's organ alone, especially now that it is so difficult to find materials in the practice of photography of sufficient interest to form the subject of a paper worthy of being read at our meetings; and members who are fortunate enough to make any remarks that are thought of sufficient importance to be published in the "PHOTOGRAPHIC NEWS" can only feel one sentiment on reading them therein—that of gratification. I presume that if you happen to commit any error in your report of them, either of us would be only too happy to have an opportunity of seeing his name appended to a letter in the photographic publication which is honoured with the correspondence of such eminent men as Sir J. Herschel, Mr. Fox Talbot, and others.

You observe in your article, that you "regret that the names of the members of the Council, whose united wisdom led them to the enunciation of the above dignified resolution, are not appended to it." I share that regret with you. I cannot help doubting whether there could have been even a sufficient number of the Council present to form a quorum, though only five members are necessary for that purpose; and for the sake of the reputation of those members of the Council in whom I am more particularly interested, I should have been glad to have been assured that they were not of the five. I am thoroughly and entirely convinced that if even half of the members of the Council had been present when the resolution was mooted, nothing would ever have been heard of it, except from the conversation of those of our body who are more than usually well-informed of the subjects of debate at the meetings of the Council.

I am sure that my fellow-members of the Society will agree with me that the proceedings of the Council in this matter have been uncalled for, and unworthy of the Society. In a matter of such importance, affecting, as it does, its character, I conceive that the resolution ought first to have been submitted to the Society at one of its meetings. What will the public think of such an attempt to suppress reports of the proceedings of a public body? The Council may argue that they had no intention of suppressing reports of the proceedings, but their resolution amounts to this, since it expresses a determination to allow no other publicity than such as it chooses to sanction, which is almost as unsatisfactory as if they prohibited their publication altogether.

I again assert my conviction, that if the Council in a body, including its President, had been present when the "Resolution" was proposed, the public would have heard nothing of it; and I trust that if an opportunity arises for the discussion of the matter at our next meeting, the members of the Society will not be backward in expressing their decided disapproval of the Council's proceedings in this matter.

I inclose my card for your private satisfaction, but I do not wish you to append my name to this letter unless you see an urgent reason for so doing. At the same time I shall not hesitate to avow and maintain my opinion at a suitable time and place, if any opportunity occurs for so doing. In the meantime, I subscribe myself simply as

AN *Ex*-MEMBER OF THE COUNCIL.

To the Editor of "THE PHOTOGRAPHIC NEWS."

SIR,—Having read your leading article last week, as well as that which called it forth, in the Journal of the London Photographic Society, I cannot avoid putting to myself the question, am I in England, in a country glorying in a free press and liberal institutions,—in a land remarkable for its scientific discoveries, its literary attainments, and, more than all, for the publicity of all its great social as well as political movements? The resolution passed by the Council of the Photographic Society is so utterly un-English, so completely repugnant to all our habits and sympathies, and approaches so much more closely to the measures adopted on the other side of the channel, that I am more than half inclined to believe that the Council in question is but the London representation of some great parent *Société Photographique* in Paris, with Louis Napoleon for its president.

I say that the "resolution" is not only un-English in its general scope and bearing, but that it is at open variance with the regulations of every scientific institution. The Society of Arts, the Geographical, Ethnological, Geological Societies, and all kindred associations, seek every opportunity of laying their discoveries before the world. They court publicity; they gladly avail themselves of every medium which offers this desirable end. It is left for the Council of the Photographic Society to introduce a new order of things; to make a new epoch in the history of scientific progress; to stand forth as the champions of exclusiveness; to claim their right to gag the free press of England, and to forbid the publication of any valuable discovery or important fact in photography, until they, the oracles, shall have secured it the minimum of publicity which their own petted journal affords. There is something exceedingly anomalous in all this. Here is a company of scientific men, claiming an indefeasible right to scientific discoveries. Here is a scientific Council ostensibly bent on the improvement and extension of our beloved art, yet unwilling that any improvement should be published, or any attempt made to extend a knowledge of the most recent discoveries. Here are photographers—which, if I know anything of the meaning of that term, is a name which signifies delineators by *light*—anxious that everybody should remain in the *dark*, unless they receive their modicum of light through the literary lantern of the London Photographic Society.* Of all men, photographers should love the *light*—light of all kinds, and not, with the narrow-minded sordidness of a trading clique, make, or *strive* to make, a market of their proceedings.

I say *strive* to make a market of their proceedings, for that any benefit can possibly result to themselves by such an effort is out of the question. The Council may endeavour to give an impetus to the circulation of their own obscure organ by an attempt to damage the sale of your widely-circulated journal; but the attempt must fail. Everybody knows something about the "PHOTOGRAPHIC NEWS;" but who—beyond their own immediate coterie—knows anything about the journal issued by the Photographic Council? I find your journal quoted everywhere; but I never find a paragraph of theirs creeping into any daily or weekly paper, however obscure. How is this? Just because your journal is what it professes to be—photographic *news;* and if the Council, or any of its members, doubt the immense circulation you have gained, let them inquire at any bookseller's or photographic depôt in town or country.

After such a "resolution" as that adopted by the Council, I, as a member of the Society, shall at once withdraw. That petty malice at the success of another journal should be allowed to interfere with the progress of science, is absolutely preposterous. Surely scientific men should hail every means of spreading a report of their investigations, and be the better pleased the more widely those reports are spread. One can scarcely credit the idea of a learned Council stooping to the paltry annoyances which a small-minded opposition trader might offer to a respectable neighbour. But the members of the Council have put the matter beyond a doubt by their late "resolution,"—a "resolution" which is calculated to diminish their Society by driving out all those who are really anxious for a wide-spread knowledge of photography. Who would not shrink from the invidious position of being

* *Lucus a non lucendo.*

connected with a Council so narrow-minded, so short-sighted, and guilty of such petty malice? Who that cares anything for the progress of scientific investigations, would not rejoice to avail himself of the medium offered by your excellent journal? Is it not obvious to the most ordinary capacity, that a real lover of science is anxious to spread a knowledge of that science? Is it not plain that no envious feeling at the marvellous success of a scientific journal would be excited in the breasts of those who were thoroughly devoted to the cause of science? And does it not appear, from the "resolution" of the Council, that they positively grudge the scientific public a knowledge of their investigations? The result is sure to be mischievous to themselves. In free England, tyranny of every kind is repugnant to us all. We cannot tolerate interference with the public rights, and the Council which would borrow a leaf from the *Code Napoleon*, and incorporate it with their philosophical transactions, is that sort of Council which is unfit for England, diametrically opposed to our national feelings, and utterly unworthy of us as a great people.

I do not despair, sir, of pursuing my photographic researches in defiance of the awful denunciation of the Council of the Photographic Society. I am confident that the Society has little or no sympathy with its Council. You number warmly attached friends amongst its members who are animated by a noble desire to send forth the result of their investigations to the world, and who are not to be awed into silent submission by any tyrannical resolutions. All the information that is of any importance or interest to photographers will certainly find its way to your journal, and while I can read the "PHOTOGRAPHIC NEWS" I shall rest satisfied that I know all that need be known about the progress of our valuable and interesting science. I would, however, offer a suggestion to the Council, which that august body is at liberty to take or leave as it pleases, namely, that a neighbouring country would be far more congenial to its spirit and sympathies, and that in the land where freedom of speech is denied, where the press is gagged, and where men may scarcely dare to *think* a free thought, it would find a state of things exactly in harmony with its own "resolutions."—I am, sir, your obedient servant,

A PHOTOGRAPHER WHO SEEKS THE EXTENSION OF HIS ART.
Monday, Nov. 29, 1858.

CARBON PRINTING.

SIR,—It was my intention to have troubled you with this last week, but afterwards I determined to wait and see if your No. 12 gave any further particulars connected with *printing in carbon*. You did certainly mention rather briefly the part your "enthusiastic contemporary" has played (to the no small amusement of his readers) in this matter, but I imagine that had you known the *whole secret* you would not have "drawn it so mild."

It is patent to the photographic world how the subscribers to the journal alluded to have since about last March been continually "worried" for subscriptions towards purchasing the *secret* of carbon printing, but all the "philanthropy, energy, and prophecies" of your contemporary failed to convince photographers of the importance of the process. Why? They had not forgotten how many silver baths, with lemon juice, &c., had been spoiled, how much paper wasted, and the amount of disappointment, not to say disgust, they had experienced through a certain *permanent* printing process so continually paraded in the columns of the before-mentioned journal. I remember laughing heartily at a letter in another of your contemporaries, some time since, by a gentleman who had been practising the "permanent process;" he succeeded in getting *one* tolerable print, but could not repeat his success. As a last resort, he wrote for a "specimen print," and to his great surprise and annoyance found it was no better than what he had considered failures. Now, this identical circumstance happened to a friend of mine. He practised the process, and obtained *once* the best print I ever saw, but could not do so a second time. He wrote for a specimen, and I imagine I now see how his countenance changed as he took it from the envelope.

Nor can it be wondered at that "doubt and mistrust" have been excited in the minds of photographers when the organ in question has been selected to bring the matter before them. In the sketch last week you omitted to state that in the early attempts to induce photographers to buy the "secret," it was held out that "if the subscriptions did not reach the desired amount (£100), we should have to wait patiently till the specification was published, and that then the patent would be binding on every honest man," evidently implying that the full particulars were contained therein: it was certainly not the work of men acting "truthfully and manfully," to be afterwards told by them, *the specification did not include the particulars of the process*, and in nearly the same breath to be informed *minutely* of a carbon process by Mr. Seely, of an American Photographic Journal, and admitted to be "pretty nearly the same as the secret process"—"that by it better pictures have been produced in America than those sent from here." Compare the candid admission of Mr. Seely that he subsequently found he had been "anticipated by M. Poitevin years before," with the "emphatic" statement of your contemporary, that the "secret process" is "different" in important particulars, and very superior to the patented process of M. T. de Beauregard, described in the published specification. But the worst remains to be told. You concluded last week's article by informing your readers the subscription list was again open; that £100 was the sum required, and that then the amount was nearly subscribed. Your contemporary, on the 15th inst., informed the subscribers "that on forwarding the sum they had promised the FULL particulars by which they could at once produce good pictures would be sent them, and information given which, if published, would be very important." Now, happening to be a subscriber (whose mind was not free from "doubt and mistrust," and who was induced to subscribe chiefly from your remarks on the specimens you inspected), I felt curious to "know the proportions of the ingredients, the mode of mixing and applying them to the paper," and also the "particular kind of paper which it is really necessary to employ;" and though almost prepared for anything, was rather crest-fallen, when expecting to receive a "Pamphlet," with full particulars, at finding that half a sheet of indifferent (letter-size) paper was sent, with extra wide margins, sufficed to contain all the "would-be patentee" has thought fit to divulge to his subscribers. It approximates most to the directions usually to be found on packets of patent starch, baking powder, &c. I may add, the proportions and mode of applying are rather *vague*, and scarcely different to Mr. Seely's, whilst the "vegetable carbon and particular kind of paper" are never alluded to; but a separate circular states they can be *purchased from the inventor*. Some friends here have been trying to produce pictures by following implicitly the directions given, but without success. I sincerely hope, for the sake of photography generally, there may be more virtue in the "prepared carbon and particular kind of paper" than we are at present aware of. I inclose a print produced last week by M. T. de Beauregard's process of applying the bichromate and gum arabic to the paper first. The carbon was prepared by collecting the flakes of the smoke from burning camphor. It was difficult to grind up with water, but easily so with alcohol. With these particulars, I leave your readers to form their own opinions as to the way the process has been managed and sold (it beats Rarey outright), and also as to the merits of the process itself, compared with others said to be so vastly inferior. Hoping subscribers generally have been more fortunate, I remain, yours, &c.,

Nov. 29, 1848. CARBON.

THE RASPBERRY SYRUP PROCESS.

DEAR SIR,—I have just received the "PHOTOGRAPHIC NEWS" of the 19th, and I hasten to say a few words about the letter in the *Times* of the 19th, written by Murray and

Heath. While I was in England, having occasion to call at Murray and Heath's, and other photographic houses, I mentioned to them, and also to several amateurs, the raspberry syrup process, which I had found and still find the simplest and surest process of any I have hitherto experimented with, but I had not the slightest idea that any one to whom I mentioned it would have made it thus public: and though I do not exactly blame Murray and Heath for having done this, they certainly have stolen a march upon me; for, on my return home, I set to work to write you a full account of the process, detailing the result of experiments on plates prepared seven weeks ago—sudden illness prevented my finishing it. The negatives taken on plates prepared this time are in every respect most successful; and as soon as I am able I will send you proofs of them. . . . .

You speak of the raspberry syrup being a remarkably indefinite compound; all I can say is, that whether fresh or old, whether purchased at one shop or another, it invariably answers the purpose required. The least amount of mucilaginous matter and malic acid in the raspberry renders the syrup a valuable preservative. In a few weeks time I shall have an opportunity of sending you a small quantity of the syrup purchased here, wherewith to experiment. The price of the article here is about tenpence a pound, a quantity which will last a very long time. Murray and Heath have omitted to say that it is necessary to use with the developer a few drops of nitrate of silver solution.

Yours very sincerely,

Lausanne en Suisse, Nov. 22nd. J. LAWSON SISSON.

GRAPH *v.* GRAM.

SIR,—You never can mean that it would be correct to alter litho*graph*, photo*graph*, stereo*graph*, into litho*gram*, photo*gram*, stereo*gram*, making them identical with epigram, monogram, anagram. At this "scientific" rate we should be invited to the *grammic* not the *graphic* conversazione, &c. &c.

If you had rapped with your ferule the unsuspecting pates of para*graph* and auto*graph*, it would have been more to the purpose.—Yours, &c., SOL HYPO.

[We are quite serious in maintaining that lithogram, photogram, and stereogram are etymologically correct when they signify the things indicated and not the indicators.]

Photographic Notes and Queries.

MR. M'CRAW'S PROCESS.

SIR,—I must apologise for delaying so long in complying with your request to send you further particulars regarding what has been called out of courtesy *my process*, but more of this anon.

I find that the chief difficulty with some of your correspondents, as well as some of my friends who have been trying this process, has been getting dirty negatives instead of tolerable positives. This may result from either of two causes, or from both—these are, over printing, but chiefly imperfect washing before immersion in the iron bath.

As the exact time for exposure to the light will be best ascertained by experiment, I would recommend that two or three pictures should be printed, giving them all different lengths of exposure, then let them all be washed and deepened together.

I think there is only another point that needs to be alluded to, and that is, to learn the effect of the last mixture of pyrogallic and acetic acids, and acetate of lead. If the prints look pretty well before immersion in the above, let them remain about half a minute; but should they appear dark and overdone, allow them to remain until they are clear enough, as this mixture has the effect of taking them down. Care must here be taken that the delicate half tints are not destroyed by a too prolonged immersion. If the pictures then look dirty in the whites, they have been insufficiently washed; but if the whites refuse at all to appear, then they have been much overprinted. Again, if the whites appear without sufficient middle tint, the fault is too short exposure to light.

So far as I am aware, we are indebted to M. Sella for the first idea of this process; but, I believe, Mr. Sharp claims it for his friend Mr. Perry. I have not been fortunate enough to fall in with any description by Mr. Perry of his process, so in the meantime I propose to call what I have done experiments with, or experiments on, M. Sella's process.

Before concluding, do you happen to know whether there are any patents in force affecting this process?

WILLIAM M'CRAW.

54, *Frederick Street, Edinburgh.*

ALABASTRINE PHOTOGRAPHS—CHROMO-PHOTOGRAPHS.

SIR,—Many of your readers have no doubt tried the Alabastrine Process, and after varnishing have hardly been satisfied with the result; to such the following remarks may not be unacceptable:—

1st. Let the redeveloping solution stay on an hour, instead of ten minutes.

2nd. Use a dilute varnish—equal parts of ordinary chloroform varnish, and chloroform, for instance: the motive of this is to give a gloss to the shadows, while the lights are pure and have not that disagreeable semitransparency which is the result of using a full bodied varnish. The picture can now very readily be coloured so as to be seen nonreversed by—first, tinting in the usual manner; and, secondly, pouring on and off ordinary turpentine, dry at the fire, deepen the tinting where required; this has so altered the appearance of the deposit, that the tinting shows nearly as plain through the glass as it does on the collodion side; back up with another glass, pour the black varnish on that, and the chromo-photograph, or whatever other name you may please to call it, is finished. W. G.

EXCHANGING PHOTOGRAPHS.

SIR,—Among the numerous readers of the "NEWS" there must be many who have been trying Fothergill's Dry Process during the past summer, and some with more success than others; of the successful few I have a favour to ask. Will any of them be kind enough to send me one or two of their *best* prints, either for inspection, and to be returned, or to be exchanged for an equal number of my own? If in exchange, stereograms preferred. I have been working this dry process with tolerable results, and should much like to see what success has attended the efforts of my brother amateurs.

Inclosed you have a couple of stereograms for yourself;—not *spoiled* prints, from yours truly,

ARCHIBALD BURNS.

4, *Carlton-hill, Edinburgh.*

[We do not think many of our readers will lose by the proposed exchange if they receive as beautiful pictures as Mr. Burns has sent to us.—ED.]

SALE OF METHYLATED SPIRITS.

SIR,—It is a curious fact that though parliament passed an act for the sale of methylated spirits of wine, free of duty, to be available in the arts, and of practical use for various purposes, at a third of the price of rectified spirits of wine, yet no chemist in this town can sell it under a penalty of a hundred pounds, unless he subjects it to a second adulteration, by adding shellac and calling it varnish.

Now I ask why was it methylated if it is to undergo a second process? It seems druggists can purchase it themselves, but are not allowed to sell it.

How do local revenue officers thus come to have the power to nullify acts of parliament? Your obedient servant,

Dublin. AGGRIEVED SPIRIT.

[We believe that the law only requires our aggrieved friend to undergo a second adulteration, if he is to be retailed in quantities less than two gallons. Methylated spirit may be sold as such with impunity in larger quantities.]

TO OBVIATE INJURIOUS EFFECT OF GUTTA PERCHA UPON THE SILVER BATH.

Sir,—Take shellac, 4 ounces, wood naphtha, 8 ounces, put into a bottle; shake up from time to time until dissolved; wash the article in *strong soda and water;* after, re-wash in clean water to remove the soda; coat the article either by immersion or otherwise, as may be convenient; dry, and if done properly, the varnish will be found an effectual and lasting remedy for the evil complained of, as gutta percha often contains small particles of iron, &c., from the circumstance of old gutta percha being often remanufactured. F. D. . . . M.

TO CLEAN A GLASS PLATE.

Sir,—One of your correspondents recommends old collodion as being very good for cleaning glass plates. I think your readers would find the following less troublesome, and cheaper:—

Make a mixture of whiting and water (not strong); place in it the glasses to be cleaned; let them remain for about 12 hours, then take out, and set to dry; clean and polish, when wanted, with dry cloth or wash-leather. This method, although very simple, I have found to be the most effectual in removing grease, and in obtaining a brilliant polish. G. N. B.

WHAT TO AVOID IN PHOTOGRAPHY.

Do not put the plate into the bath too soon after coating with collodion.

If vertical lines appear on large plates after development, do not put the plate in the bath in the usual way, but reverse it, so that the *top* or *driest* part enters the silver solution first.

Always keep the dark slide of the camera covered with a black cloth during the exposure of the plate.

Do not be hasty in observing a change in litmus paper.

Do not let any silver solutions get too low in strength.

Do not spare any trouble in cleaning glass plates; breathing on them while holding them in a sloping direction. Don't do this in your operating-room.

Do not ever pour collodion without wiping the neck and top of the bottle.

Do not make a pause in immersing a plate in the nitrate bath.

Do not lift a plate from the bath too soon.

Do not put away any materials dirty, as dry dirt is less easily moved.

ANSWERS TO MINOR QUERIES.

Plate-cleaning Liquid.—*A Subscriber* wishes to know how the solutions for cleaning glass plates are made. We have recently been making a series of experiments on this subject, and we think that we are now enabled to place our readers in possession of a receipt which, if used properly, will cause a failure from the employment of dirty glasses to be looked upon as a thing of the past. Place a couple of handfuls of common salt in a jug, and pour a pint of boiling water over it. Stir for some time, allow to cool, and filter. Mix together equal parts of fine rotten-stone and tripoli, and add about a teaspoonful of this mixture to every six ounces of the above saturated solution of common salt. To use it, shake the bottle well, and smear a little of the mixture over the plate, with the fingers or an old cloth. Now clean it well off, by briskly rubbing with a clean cloth, and give the last polish in the usual manner. The crystallisation of the salt, which takes place on the surface of the plate when the mixture is smeared over, seems to loosen the dirt from the surface in a remarkable manner, and the after friction with the cloth brings away all surface impurities. Care must be taken that no salt be left on the edges of the plates, or it will decompose the silver bath.

Toning Glass Transparencies.—*O. P. Q.* If, after taking the picture in the usual way, it is washed over with very weak chloride of gold, a greenish tinge is obtained, which is very good for foliage; by washing it over with perchloride of mercury, there is a more or less brown tinge given, according to the time it remains on; if it be kept on a long time, it becomes whitened. If, instead of developing the picture with pyrogallic acid, it is developed with sulphate of iron, it is at first rather feeble; but if that be washed over with sulphide of ammonium, it gives a rich brown. The ultimate colour of a picture can hardly be told when it is wet, the colour changing very considerably when dry. A wet picture has usually a reddish tinge, which disappears when dry. Some kinds of varnish restore that tint, others do not.

Albuminate of Silver.—*O. D.* If dilute albumen or white of egg be added to a weak solution of nitrate of silver, a compound of oxide of silver with the albumen will be precipitated, which has been termed by chemists albuminate of silver. It is a white body, sensitive to light, by the action of which it is changed to a brick red colour.

Extempore Sel d'Or Bath.—*Oliver.* 8 grains chloride of gold dissolved in 16 ounces of water, and 32 grains of hyposulphite of soda dissolved in 4 ounces of water; add the solution of gold gradually to that of soda, agitating at each addition.

TO CORRESPONDENTS.

*** *An accident at the last moment has compelled us to omit our Lessons on Colouring from this number.*

W. L. S.—The only reference to Sir J. Herschel's newly discovered metal, junonium, will be found in the "Photographic News," vol. i. p. 86.

Orientalis.—To obtain a full-length portrait in your room you must use a lens of a very short focus—not more than 4 inches.

Highbury.—We cannot give you a very definite answer to your question—it is so vague; you had better look about, and judge for yourself of the requisites for portability in a camera.

Well-wisher.—The substance you obtained was glycyrrhizine in a sufficiently pure state for photographic purposes. If required chemically pure, several further tedious operations will have to be performed, which would require the appliances of a well-appointed chemical laboratory.

K.—The question as to enlarging the pictures will be treated of shortly. A telescopic object-glass will not answer the purpose so well as a portrait combination. Wet collodion is the only feasible process. A camera capable of being considerably elongated will answer all your requirements, if it be properly supplied with lenses.

H. T. R.—Try to become *au fait* with the apparatus and processes now so generally in use before you attempt improvements. What you want cannot be yet properly managed, except by the most skilful operators.

H. S. L.—We are much obliged by your contributions of "What to avoid." Try the collodio-albumen process instead of Fothergill's; it seems to be more generally liked.

J. Sanderson.—The prints are not very vigorous, but they seem to promise well, being so cheaply obtained. We shall be very pleased to have a description of your process if you will favour us with it.

M. E. B.—Varnish them with gum arabic, as recommended recently.

T. H W.—1. Put a small stop in front. 2. Ocular inspection of a pressure frame will teach you more than we can afford space to describe. 3. Six months or more.

C. S. B.—1. We hope to be able soon to give further particulars. 2. Yes; not so good, however, as some we have given previously.

Tyro.—The spots are most likely due to the collodion, not the fixing solution. Study the lessons on colouring now in progress, and for the colours consult our advertising columns.

A. H T.—Study the lessons on colouring.

An Old Daguerreotypist.—We are sorry we are unable to help our correspondent, but having never tried the process we are unable to give an opinion. The description was given correctly.

Wilson.—The kind of varnish you mention is just the one which is wanted, and we shall feel greatly obliged by our correspondent favouring us with the receipt. 30 grains to the ounce is equal to about 6 per cent.

G. C.—Add a few drops of an alcoholic solution of iodine: if that does not remedy it, the collodion is bad.

Hg.—Your first query is already answered. All photogenic lights make a terrible fume and smoke, and their success is very partial.

H. L.—You added too much carbonate of soda in the first place. Add a little acetic acid, a drop at a time, until it shows an acid reaction to litmus paper.

Poor Tom C.—The second formula is the best; try it with the addition of one drop of nitric acid to 12 ounces of the bath.

N.—The lens may be a very good one, but it is not large enough to cover the field of your camera. No arrangement of stops will remedy this.

Communications declined with thanks:—H. R.—J. A. S.—S. H. B.—J. B.—Photo.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—Hg. Cl.—Edwin.—W. D.—C.—Tempus.—A Frenchman.

In Type:—E. R.—R. W.—G. W. H.—H. C. J.—J. C. S.—Sen. Sol.—C. F. B.—Gilder.—W. R. S.—θ.—H. T. T.—Foreigner.—W. H. W.—Iodide.—One of Devon.—T. Barrett.—J. T.—C. & M.—A. W.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Petter and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 14.—*December* 10, 1858.

WE have before us a full report of the proceedings of the last meeting of the Photographic Society; and should feel unwilling to give it the space which might be occupied by matter more interesting, were we not anxious to explain why the Council of this Society are desirous of exercising an exclusive control over the reports of its proceedings. The business of the evening was inaugurated by the announcement from the Chairman that Dr. Percy had retired from the office of Vice President, and by the notice of the withdrawal from the Council of the Right Honourable Sir George Clerk, Bart., and of the ordinary routine vacancies in the Council. Strange to say, the retirement of these gentlemen from office in this Society was unaccompanied by any observations upon the great loss which such retirement would occasion to any scientific society, and especially to one like the London Photographic Society, which has much need not only of the scientific ability of these eminent men, but of their matured judgment in influencing the actions of the Council of which they were two of the brightest ornaments. This silence is not prophetic of good, and the Chairman as the mouthpiece of the Council no doubt deemed it wise to pass over the misfortune in solemn silence. We appreciate the wisdom of the Council in adopting this course. But what are we to say of those members present who could hear of the retirement of the two gentlemen, one of whom (Dr. Percy) was, we believe, among the first originators of the Society, without an inquiry as to the cause of it, or without a single expression of regret or sympathy for the cause of a retirement in which only the Society can be the losers? But this apathy was followed by a reaction. The first moving cause which aroused the ire of the Chairman, and at once upset the usually placid urbanity of his demeanour, was what he appears to have considered the impertinent assurance of a member who dared to question the right of the dictatorial power of the Council in nominating for election those persons only whom they decide in secret conclave should or ought to supply the vacancies which occur in the Council. Now we have referred to the Society's rules, and we take the liberty of saying that the question was a very reasonable one, and one on which at no distant period the members may have good cause to ask themselves, why they permit an infringement of the right of free election of their representatives in the Council to grow up among them. We cannot suppose the members of this Society are less intelligent, or less independent, than those of other photographic societies; and yet, strange to say, the Council do not deem them competent to be entrusted with any real management of their own affairs. It is not, therefore, a matter of surprise to us, that the Chairman should have promoted discord by desiring, in a rather mandatory manner, the inquiring member to "sit down"; and successive repetitions of this imperious demand at once acted upon the meeting as a tocsin of discord. The confusion which followed defies description. In the midst of cheers and hisses, the Chairman was asked when the Council intended to fulfil the promise made by them in May last, to submit a rational and sensible code of rules for their consideration, in lieu of the regulations now in force, under which the Council exercise irresponsible power. To remind the Council of their breach of faith was evidently unpalatable, and the inability on the part of the Chairman to answer gave rise to expressions of disapprobation, and hereupon loud cries of "Carbon," "Carbon," arose. Then Mr. Pouncey, whose name has been of late rather prominently associated with the new process of Carbon-printing, stood forward to deliver, as it was supposed, an interesting lecture, illustrative of his alleged discovery. But the force of a bad example had its influence upon even Mr. Pouncey—he too had become infected with the disorder of the evening—and condescended to impart nothing beyond an attack upon ourselves and Mr. Fox Talbot in particular, and all others in general, who had not expressed approval of a process of which he calls himself the inventor; and of which he can give no other description than the production of a certain number of prints, while with an air of self-sufficiency he proclaims, "these beautiful prints are produced by my process, and I challenge any one, even Fox Talbot, to produce a silver print to equal them." There was, however, an oasis to be found in the evening's entertainment, which relieved it of its barrenness of utility, in what fell from the lips of Mr. Malone. This gentleman, in some well-directed observations, endeavoured to place Mr. Pouncey and his "beautiful prints" in their proper position in the scale of photographic art. But Mr. Malone might as well have been silent, for he only created additional excitement, which found vent in a cross fire or enfilading of the enemy, by an interposition of observations, not only remarkable for their oddity, but irritating in the extreme by their personality. The previous rashness of the Chairman brought on a *vis inertiæ*, which rendered him so insensible to the growing turbulence of the meeting, as to necessitate the rising of our good friend Mr. Vignoles to remonstrate against it.

The previous reputation of Mr. Hardwich might have been deemed of sufficient weight to restore a tone of sober seriousness to the volatile spirits of the meeting, but the result proved "there was nae luck about the house." For, as is witnessed in incantation scenes, to make up for the want of sense in the dialogue, resort is had to fire, flame, and smoke, and colours, red, green, and blue, are profusely generated in an invocation to bring up the "familiar fiend" of the operator; this sort of pantomime was enacted by the gentleman referred to, with the view to bring up the "familiar fiend," but with a vain result, for the "fiend" would not appear. In plain words, the operation proved a failure. "The paper was not so good as could be wished," and such like excuses, by way of palliation for the inability of the demonstrator to render that clear to the evidence of the sense of sight which his written paper has failed to convey to the understanding, inasmuch as that a barleycorn of information was lost in the bushel of chaff in which it was hidden. The subject having

failed to restore even a half-tone to the audience, left as much impression on its hearers as the secret of Mr. Pouncey's Carbon-printing process!

We hope we have done impartial justice to this exciting occasion. Can our readers now wonder at the objection of the Council to our publishing the proceedings which take place at their monthly meetings? We can now understand why the special organ of the Society is deemed the fitting channel through which the members who do not attend the meetings are to be apprised of the numerous exhibitions at head quarters, by a facile transposition of the whole genus of farces into genteel comedy or the more serious drama.

APPLICATION OF PHOTOGRAPHY TO WOOD ENGRAVINGS.

BY MR. R. HUNT.

Numerous experiments have from time to time been made to produce photographic pictures upon box-wood blocks, of such a character that the wood engraver would be enabled to work upon them. Hitherto success has not attended these efforts; but from some examples which we have lately seen, there is every reason for supposing that the desired end will shortly be accomplished.

It should be understood that there is not the slightest difficulty in producing very perfect photographic pictures upon box-wood blocks. Even by applying the nitrate or the chloride of silver to the surface of the wood, very satisfactory photographs could be obtained; but the difficulty in this case is, that the silver salt gives a brittleness to the wood, and it is liable to "chip off" under the tool, hence it is not possible to produce fine lines.

By coating the wood with albumen this has been avoided, but the wood-engraver complains of the presence of the film of albumen preventing him from working with his usual facility. This objection is, however, almost entirely overcome by the use of collodion, the attenuated film offering scarcely any obstruction to the engraver's tool. All that is necessary is, to adopt one of the so-called dry collodion processes, and to obtain from a good negative on glass a positive copy on the block. It is important that the processes should be simplified as much as possible, to avoid all risk of injuring the wood. It is well to coat every part of the wood, except the face, with a thin layer of transparent varnish, so that the iodised collodion may be applied, and the *face* dipped into the solution of nitrate of silver, without the risk of having any absorption. Again, in the slight fixing process which is necessary, no very high degree of permanence being required, this varnish also protects the wood. By employing a somewhat sluggish collodion process, very charming pictures may be obtained, and rendered sufficiently permanent.

Now arise the wood-engraver's difficulties. He has been trained to cut along certain well-defined lines, but he does not understand working upon a drawing in which there are none of these lines. It is, however, merely a question of education; the conventional system must be abandoned; and the engraver must be taught to use some judgment in the execution of his work. It has been proposed that practised draughtsmen should be employed to indicate, by lines on the photograph, where the wood should be cut. This would be still preserving the same mechanical system which at present exists. Something beyond this is required; and a class of engravers must be educated to work directly from the photograph, without any adventitious aid. We have before us a representation of an amphora, photographed on wood, and engraved by Mr. G. R. De Wilde, of Clerkenwell, which is in itself an admirable example of what may be done. This woodcut shows that no real difficulty exists in the production of photographic pictures upon box-wood blocks, which may be cut, and from which very beautiful impressions may be obtained.

The advantages of such an application are manifold. The truthfulness, in the first place, is one of its greatest recommendations; and for objects which have any relation to science, this is paramount to every other consideration. The rapidity of production is another advantage, since it would enable authors and publishers to be far more liberal in their illustrations than they can afford to be at present.

At this time we have engraving advanced to a high degree of excellence, and we very justly admire the results; but if we could at once transfer to the wood the copy of a negative on glass which represented some scene of sacred or historic interest, how much more satisfactory would it be to all! We know that the wood-engraver is supplied with photographs of machinery and other objects, which he copies with great labour by the pencil on wood. The same photograph on the wood should be at once available; and instead of the pencil, the wood-cutter should be instructed to use the graver. The perfection of such reproductions, as it regards the relative dimensions, distances, &c., and the correctness of all the details, would be unfailing recommendations. We learn that the wood-engravers of Germany are now availing themselves of photography to a considerable extent; and we hope we shall not be long before we have to refer to English examples of this most beautiful application to a very beautiful art.—*Art Journal.*

[We have recently succeeded in entirely overcoming all the difficulties which have hitherto prevented this application of photography from being generally employed; and in an early number we intend giving a full description of the process.]

ON AN ACTION OF LIGHT HITHERTO UNKNOWN.

BY M. NIÈPCE DE ST. VICTOR.

The following is an extract from the paper referred to, which was read by M. Chevreuil, the distinguished French Academician, at a meeting of the learned body of which he is a member.

In the two previous memoirs that I have published on this subject, it has been seen that the light gives to certain bodies the property of reducing the salts of gold and silver, and that this property continues to exist in bodies kept in darkness during a greater or less length of time, depending on the nature of the insolated body and the conditions in which it is placed after insolation.

The effects of which I am about to have the honour of informing the Academy, are similar to those referred to in the memoirs read on the 16th November, 1857, and the 1st March, 1858.

To evidence on porous bodies, organic or inorganic, the action of the light of which I am about to speak, it suffices, after insolation, to place them in presence of a sheet of sensitive paper prepared with the chloride of silver, or to pour on it a solution of nitrate of silver.

But, that the light may act on organic or inorganic substances, it is necessary that they should be finely divided; and that the action of the light on an inorganic substance may be rendered visible after its exercise by a colouring or reduction of the metallic salts—such, for example, as the salts of gold and silver—it is necessary, as is already known, and as I shall again demonstrate, that an organic body be present, at least if the salt be not a chloride, an iodide, or a bromide of silver.

Thus, for example, the division of matter suffices for the action of light to take place on the nitrate of silver and on the nitrate of uranium; but it does not suffice—for the colouring or reduction of nitrate of silver and nitrate of uranium, to reduce the salts of gold and silver.

I prove it by the experiments I have made, and the results I have obtained.

I first established the fact that the crystals of fused nitrate of silver were insensible to the light, if they were well crystallised and exempt from all organic matter; and the same

of the crystals of nitrate of uranium and crystallised organic acids.

The following are the experiments I made on the division of matter:—I poured on the freshly-broken edges of a porcelain plate (tendre or opaque), a solution of nitrate of silver which had been fused; I afterwards exposed it to the sun, having taken the precaution to protect the part from the light by means of a screen, and to preserve the other from all organic matter. After an insolation of about an hour, I could not perceive the slightest colouring in the insolated part; but the action of the light had taken place: for, when I poured on the edge of the plate a solution of chloride of sodium, I saw, after some time had elapsed in darkness, the chloride of silver blacken on the part of the edge of the plate which had been acted upon by the light; this same part blackened very rapidly if the whole were exposed to diffused light.

The results were the same if the edges of the plate were insolated, impregnated with chloride of sodium, and nitrate of silver was afterwards poured on.

On repeating these experiments on hard and vitrified porcelain, the same effects were produced, only more feebly, because it is the same thing as if one operated on ground glass.

If the edges of an opaque porcelain plate (freshly broken) are impregnated with a solution of nitrate of uranium, it will be in vain to insolate it, if there be no trace of organic matter; the salt of uranium will not reduce the salts of gold or silver, as it does when insolated in presence of organic matter: but the action of the light has taken place, for if one pours on the edge nitrate of silver containing a little starch or gum, and afterwards a solution of sulphate of iron or gallic acid, a colouring will be perceived on the insolated part; and the same results if nitrate of silver has been insolated.

To experiment with a soluble substance, the sheet of paper is most suitable, because it is at the same time porous and of an organic nature, which is indispensable for the action exercised by the light to be rendered evident.

To experiment with a soluble substance, a sheet of paper is impregnated, and left to dry in obscurity, afterwards exposed to the light, taking care to mask a portion of it by means of an opaque screen, or to cover the whole surface with a photographic negative. After the insolation, it must be brought in presence of a substance which shall be a re-agent for the insolated soluble substance, and a photographic picture is then developed; this induces me to say now that one may practise photography with the substance nearest at hand, or render visible the action of the light on every species of organic or inorganic substance, provided that a substance be employed as a developing agent, capable of entering into combination with the insolated substance.

The principal re-agents to employ for demonstrating the action of the light are, the salts of gold and silver, the tinctures of turnsole and curcuma, and the iodide of potassium, for ordinary paper of commerce sized with starch.

In many substances acted upon by the light, the activity communicated manifests itself, besides, by a remarkable insolubility: they may be washed in abundance of water without dissolving; humidity, especially if combined with heat, makes them very promptly lose the activity acquired by the insolation, and they again become soluble.

It is for the same reason that humidity and heat astonishingly accelerate the reduction of metals under the influence of light.

In a great number of cases the operations may be reversed, and the same results obtained; which I propose to demonstrate by citing some of my experiments.

A sheet of paper impregnated with a solution of chloride of gold, covered with a photographic negative, and insolated, produces an image when passed in a solution of nitrate of uranium, of sulphate of iron, of sulphate of copper, of bichloride of mercury, or of salts of tin.

Now, if one operates in an inverse manner, that is to say —if the paper be previously impregnated with one of the salts just mentioned, and afterwards passed in a solution of chloride of gold, the result will be the same. A sheet of paper impregnated with a solution of nitrate of uranium, insolated under a photographic negative, passed afterwards in a solution of red prussiate of potash, gives a beautiful red picture, which is fixed by well washing it in distilled water; the light has no sensible action upon it; heat or dehydration makes it pass to a maroon brown; but it reassumes its red colour by cooling or hydration. If it be passed in a solution of salts of copper without washing, and afterwards exposed to heat, it acquires different tones, according to the greater or less intensity of the heat. The primitive picture still reduces the salts of gold or silver, and if the red proof is passed in a solution of bichloride of mercury, and afterwards in oxalic acid, a picture is obtained by the action of the heat, almost identical with that obtained with the nitrate of silver, and which continues after the cooling; the red picture treated with sulphate of iron gives a blue picture.

A sheet of paper impregnated with the red prussiate of potash and insolated, will give the same blue picture, if passed in a solution of bichloride of mercury or acidulated water; this picture, formed of prussian blue, is greatly heightened by the action of heat, by the vapours of hydrochloric and nitric acids, by a solution of oxalic acid, &c.

On a sheet of paper impregnated with red prussiate of potash, pictures of different colours may be developed, either successively or simultaneously, by employing suitable re-agents—the salts of silver, of cobalt, and others.

A sheet of paper impregnated with gallic acid and insolated, treated with the iodide of potassium, gives a latent or feeble picture, which will become very vigorous if it be afterwards passed in the nitrate of silver. It is the reverse of what one does in ordinary photographic operations.

A sheet of paper impregnated with sulphate of iron and insolated, treated afterwards with iodide of potassium and nitrate of silver, gives an analogous result. Impregnated with gallic acid, insolated and treated with the proto-sulphate of iron, the sheet of paper will give a brown or black picture; the result will be the same if the operations be reversed.

A sheet of paper impregnated with bichloride of mercury, and insolated, gives a picture with the protochloride of tin, soda, potassa, and the sulphide of sodium.

A sheet of paper impregnated with the protochloride of tin, and insolated, gives a picture with the sulphide of sodium, bichloride of mercury, chloride of gold, and nitrate of silver.

A sheet of paper impregnated with chromic acid or red chromate of potash, and insolated under a negative, gives, with the nitrate of silver, a red purple picture, formed of chromate of silver; but it is the parts protected from the action of the light which give the picture; that is to say, that the chromate of silver does not form itself with the chromate of potassa acted upon by the light.

Many other metallic salts are equally sensible to the light.

The importance of the foregoing discoveries of M. Nièpce de St. Victor, may not at first strike the reader; nevertheless, it opens a field to photography almost as extended as chemistry itself, inasmuch as almost all soluble chemical substances are rendered available in the practice of the art. Take a sheet of paper and impregnate it with any soluble substance, let it dry in a darkened room, and then insolate it under a negative, take it back to the dark room, and treat it with any of the re-agents capable of combining with the substance operated upon, and you will have a picture of almost any colour you desire; for example, if the paper be impregnated with nitrate of uranium, exposed, and then treated with a solution of red prussiate of potash, a beautiful red picture will be obtained; and if this be afterwards treated with sulphate of iron, a fine blue picture will be produced; and if other re-agents be employed instead of the sulphate of iron, pictures of different colours may be obtained.

THE COLLODIO-ALBUMEN PROCESS.*

5th stage—Exposure.—As most operators agree that the development should not be delayed beyond two or three weeks, of course it matters not in what part of this period the exposure takes place. The time in this process need not be measured so exactly as with any other kind of sensitive plate or sheet, but an approximate idea only can be given. In summer, with sunshine, a stereoscopic landscape, lens with ½ inch opening, will average 1½ or 2 minutes. With a 16 inch focus lens, and ½ inch opening, from 5 to 7 minutes will be requisite; but in a deep wood I have had to expose 30 and 35 minutes, and even wet collodion would have taken 10, though the sun was shining brilliantly—so that the operator must judge for himself. If there are dark nooks and patches in his picture, he must expose for them, as he can remedy over exposure. In the next stage, which is

6th—The development, my method differs from the general one. I use

Saturated solution of gallic acid		8 parts.
Nitrate of silver,	5 grains...	1 part.
Glacial acetic acid,	5 drops	
Distilled water	1 oz.	

Pour water over the plate, then drain and level the plate, which is well done with a funnel placed in a round hole, cut in an old box, or board supported at each end. Pour upon it the gallic acid and silver solution; see that it covers the whole plate, and then it may be left ten minutes or thereabouts, when it must again be looked at, and if the details are not coming out pour off and add 1 part gallic acid solution, and one part silver. This will generally give the blacks greater intensity, and in time, betwixt 30 minutes and one hour, the negative should be fully out; but sometimes it takes much longer through under-exposure. A few days ago, I took some views on a peculiarly dark day, which were three hours in developing, although in the last hour I used an equal mixture of the silver and gallic acid solutions. Yet the whites are as transparent as though they had been exposed in summer, and developed in half an hour. The time taken by development seems long, and would be so for twenty pictures, but it is easy to develop three, four, or even a dozen at once. I always bring out a quantity at the same time, so that this quantity only takes the real time that one or two would if brought out singly. A good picture in this, as in every process, should have dense sky and the minute markings in the shade.

I before observed that this mode of developing differed from that in general use. My own, and many of my friends' opinion, is, that the above is the safest, and gives the best half tones. I have, however, known many operators who prefer the one more generally used; so I will give that as well, that the beginner may try both, and make his own choice—

SECOND DEVELOPING SOLUTION.

Gallic acid	1 drachm.
Pyrogallic do.	½ „
Alcohol	1 „
Glacial acetic acid	1 „
Distilled water	20 ounces.

In a dish of this solution place the plate, and in a few minutes add a drop or two (not more) of a 40 grain solution of nitrate of silver to an ounce of water, and the development will be complete in an hour or two. If the blacks are not intense enough, or if the development seems to become stationary, add a few drops of the silver solution.

The measure which is used for the gallic acid and silver should be perfectly clean; indeed, it is the safest way of proceeding to wash the measure, after developing, with a strong solution of cyanide of potassium, and after that, well with water. Nothing remains now but the

7th—Fixing and varnishing.—It was the custom with many to use cyanide of potassium to fix the collodio-albumen negatives, but this I have proved to be a great mistake by fixing one by this salt, and another by hyposulphite of soda, and comparing them. In the first place, the time it would take to dissolve the iodide of silver out of the "whites" by cyanide, is long enough for the opacity of the "blacks" to be much—very much—injured. Again, very often it curls up the film, so that in drying, marks are left like cracks in the glass, and frequently it loosens the coating so that it leaves the glass. Hyposulphite of soda is free from all these faults, and if the plate is placed in a solution of 1 oz. of the latter to 6 oz. of water, from 10 to 20 minutes will suffice to fix it, which can readily be seen by the yellow colour leaving the unaffected parts transparent and clear. Wash gently, and leave the plate in water for an hour, renewing the water once or twice. Wash then, and dry by gentle heat, when it must be varnished. Each maker has the way to use his varnish marked upon his bottles—whether with heat or no. That which I use requires no heat, and is very good; but many prefer that which is applied whilst the plate is warm. But if the cold plate is used, it must be *perfectly dry*.

Causes of failure.—This I always look upon as a necessary chapter in the description of any process, as few photographers are chemists, and still fewer have any teacher to appeal to in case of failure. The greatest reputed drawback to this process is *blistering of the plates*. I never had but one blister out of hundreds of pictures; but my friends occasionally have had some great disappointments from this cause, and in every instance which I could thoroughly investigate I have proved that the plates were not dried properly after albumenising the collodion film, and almost always that they were stowed away damp after the last bath. This does not show until in developing small blisters rise like bubbles, and in drying leave a mark which is printed. I once, for a friend, developed a lot of scenes in the wildest part of Scotland, and none but an artist could imagine my vexation at seeing the most exquisite scenes I ever beheld, without any exception, come out, and then be spoiled by blisters like bubbles rising as thickly as rain-drops, and spoiling every plate.

My belief is, that if a man will use proper collodion, and attend to this particular, he need not meet with this failure. Neither thick nor thin collodion is the cause—that I proved, and stated my experiments in one of the journals; and I have come to the conclusion that it is either an unsuitable collodion or the want of dryness in the plates.

It will be understood that dust, which causes spots on the picture, must be guarded against.

Some of the advantages of this process seem to me to be—the keeping of the plates, which I have stated to be on an average three weeks. I have, however, last week been using a lot of plates prepared in August, and kept since then in a tin box: the results are as clear in the lights as if they were not a week old—the blacks are intense, and the minuteness and half-tone almost, if not quite, as perfect as I ever got. Surely this says enough for their keeping qualities.

Again, I am using the same silver bath which I have used two years; of course, having replenished it often with a 40 or 50 grain solution of silver. When it becomes deeply discoloured, as it does at times, I add a little kaolin, shake up, leave for a few hours in the light (I find the light aids it in clearing), then filter into the bath again. If the negative looks very dirty, when dry rub it gently with a soft silk handkerchief, and this will often remove this appearance, as it frequently arises from a deposit which takes place in developing; but this is very seldom the case if the things are clean.

The stages of this process seem many and intricate, but as this account is written for the younger student, it must be remembered that I have made them separate so as not to be overlooked; and I believe that some of them may be performed in a very little longer time than described.

My own belief is, that the first preparation, up to the time when the plates are dry, may be performed by daylight; but

* Continued from page 146.

let not the beginner try any experiments. The reason why I give this opinion is, that I was once preparing a lot of plates, when a friend of mine threw open the door, and the sunshine fell upon three or four before the albumen had been applied. These I marked as experimental, but in bringing out the pictures I could perceive no difference whatever betwixt these and others prepared in the usual manner.

As to the results of the above process, I must refer the reader to the editor of this journal; as he, having seen a few, is a less interested person than myself. Θ

[We can assure our readers that the pictures which our valued correspondent has from time to time forwarded to us as specimens of the collodio-albumen process, which he has so intelligibly described, leave nothing to be desired. We can confidently recommend the above paper to the careful attention of our readers.—Ed.]

GENERAL OBSERVATIONS ON PHOTOGRAPHIC POSITIVE PROOFS.*

BY MM. DAVANNE AND A. GIRARD.

4. *Sizing by Sulphuric Acid.*—It is known that by submerging a sheet of paper in sulphuric acid diluted with half its weight of water for a few instants, washing it in pure or ammoniacal water, and then drying it, a hard and resisting substance is obtained, to which the name of parchment applies very well. We treated many papers of different make in this way; but on submitting them afterwards to photographic preparations, we encountered serious difficulties. On coming out of the sulphuric acid bath and the washing-water, the paper curled in drying, and it was only with great difficulty that we succeeded in extending it on the salt bath, where it is besides necessary to submerge it; on being taken from this, as well as from the silver bath, it dried very slowly, and its desiccation was not complete at the end of three hours; finally it undergoes, under the action of heat, a considerable shrinking—so much so that, if the operator opens the printing frame in order to observe the progress of the proof, the fleeting instant during which it is relieved from pressure is sufficient to enable it to shrink perceptibly, and the consequence is, that the lines are doubled; therefore it appears to us difficult to bring this mode of proceeding into use.

Spots on the Positive Paper. — These spots may be divided into two distinct classes: those visible *à priori* offer but a trifling danger, for it is always easy for a photographer to choose pure paper, and to preserve himself from the consequences of spots of this description. The others, invisible *à priori*, are of more importance, not only because they often attain large proportions, but also, and especially, because it is impossible to preserve oneself from them by the most searching examination of the paper. The first division contains four kinds of spots:—1. Those opaque, of a deep brown, almost black, often attaining a millimètre in diameter, show themselves now on the surface, anon in the body of the paper. If some of these spots be isolated with great care, and calcined in the air so as to destroy the organic matter, they undergo no change, and the residue, which dissolves with difficulty in hydrochloric acid, answers afterwards to all the reactions of salts of iron. The nature of these spots is not doubtful, they are formed by oxide of iron; as to their action on the proof, it is sensibly null. After its development they appear in the same state as when the paper was free from all preparation. 2. Others, much more rare, show themselves of a clear blue colour; their nature is easy to establish; they arise from small portions of ultramarine used in giving a blue tint to paper. Moreover they are without any action on the development of the proof. 3. Others are simply formed of small fragments of straw. 4. Finally, others, which the microscope has brought to our knowledge, are formed of small particles of resin arising from the local decomposition of the resin soap employed in sizing. They do not, any more than the preceding, appear to exercise any prejudicial influence on the development of the picture.

But let us now come to the spots we have provisionally designated as being invisible *à priori*. Everybody is familiar with the disastrous effects they produce on proofs. There, in places which previously offered no sign of impurity, they show themselves on the paper, when withdrawn from the hyposulphite of soda bath in the form of starry spots, reaching two and sometimes three millimètres in diameter; around these spots extends a white circle, or at least, one containing very little colour, often prolonged in a train of the same nature, which always follows the direction in which the liquid ran when the paper was hung up to dry.

The first point for us to examine was, the instant in the preparation when these spots were produced. We ascertained that the silver bath had no influence in producing them, and that they never appeared in that bath. But if we follow the proof from the nitrate of silver bath, we shall see the phenomenon manifest itself even in darkness. Some points speedily blacken, and this state of things goes on increasing up to a certain limit. Owing to a cause yet unknown, the nitrate of silver, which covers the sheet conjointly with the chloride, decomposes, and the silver crystallises; the liberated nitric acid remains around the spot and forms an acid "glory," which there is at first nothing to indicate. But when the sheet has slightly blackened in darkness, the acid circle which surrounds the spot (which is less sensible inasmuch as the central crystallisation has deprived it of a certain quantity of silver) does not blacken in unison with the rest; and if the blackened proof be passed on ammonia to fix it, the crystals remain, and all round them a slight circle is manifested, a little less coloured than the ground because less sensitive: if, on the contrary, it is submitted to the action of the hyposulphite of soda, the salt which is decomposed where the acid circle is, disengages sulphurous acid and sulphuretted hydrogen, which darkens the already partially-discoloured circle; while at the same time, under the influence of the hydrosulphuric emanations, the crystals of silver sulphurise while preserving their form.

The mode in which these spots are formed once known, it remained to establish the cause; different experiments proved that they were to be sought for in the pulp of the paper itself, that they were due to the presence in certain parts of traces of tin or copper left by the *cannelures* of the copper or bronze cylinders. The most certain remedy would be to replace them by steel cylinders; these would certainly give metallic traces from wear, but they would be far less numerous from the greater hardness of the metal, and besides the traces of iron would oxidise in the salt bath, and the resulting oxide of iron could not precipitate metallic silver. But a much easier and more simple method would be, after the refinement of the pulp, to submit it to a new bleaching with chlorine water, or, better still, a solution of hypochlorite of lime heated with a dilute acid.

Effects of the Salting.—The object of salting is to introduce a soluble salt in the paper, generally a chloride, capable of forming, with the nitrate of silver, an insoluble silver salt, upon which the light afterwards exerts its action.

Influence of the Concentration of the Salt Bath.—We have prepared with this reagent solutions of a strength of from one to ten per cent., and printed under the same negative the papers thus differently prepared; the result was remarkable, and the difference between one and two, and two and three, well marked. The tint of the proof, at first weak and red, ascended rapidly with the increase in the quantity of chloride, but soon went beyond the red tones to others deeper, and ended ultimately in black opaque tones, a result which, we may safely affirm, few photographers would imagine. Chemical analysis soon gives the reason of this phenomenon, for it shows that the greater the strength of the bath, the more of soluble chloride the paper absorbs,

* Continued from p. 137.

and, by consequence, the more silver it appropriates in its passage through the nitrate bath.

Influence of the Duration of Contact between the Paper and the Salt Bath.—After dividing a sheet of paper into two parts, we salted the first by a simply floating on the bath, the second by a total immersion, the contact otherwise being for the same period in both cases. No considerable difference was afterwards seen between the pictures obtained on the two halves.

To inform ourselves of the influence of the time of contact between the paper and the salt bath, we placed on it pieces of paper which we left one, five, ten, and twenty minutes. The proofs obtained on these pieces of paper under the same negative presented very slight differences; and these were always uniform, that is to say, the augmentation of the quantity of salt led to blacker and more vigorous tones.

Indeed, the mode of using the salt bath, and the time of contact between it and the paper, are matter of little moment as regards the final result.

Lessons on Colouring Photographs.

COLOURING POSITIVES ON GLASS—(*continued.*)

To choose the Photograph.—To produce the best results, it is necessary that the photograph be a good one; but all good photographs are not equally suitable for colouring. An over-exposed flat positive can never be made a good picture by any process; a slightly under-exposed but otherwise well-managed photograph may sometimes, however, present a fine specimen of *chiaroscura*, and be worth retaining as a good, vigorous, uncoloured picture, whilst any attempt to colour it with powder colours would probably render it heavy and muddy. A positive most suitable for colouring should be properly exposed, and sufficiently *well-developed* to secure purity and intensity in the lights, which should have a somewhat chalky surface, presenting what is termed in crayon drawing a "tooth" to the colour. A bright metallic positive, with a surface glossy in the lights as well as the shadows, sometimes looks exceedingly well as an uncoloured picture; but is difficult to colour, and unsatisfactory when done. A photograph with dull, tawny lights, cannot be expected to make a brilliant-coloured picture. The face should be well lighted, without heavy, abrupt masses of shadow. It is no part of our province in this series of articles to speak of the operative department of photography, but we may remark, *en passant*, that the proper lighting of the model is one of the most important, and, at the same time, least studied and most imperfectly understood, duties of the photographer. A well-lighted picture makes the work of the colorist infinitely more pleasant, and enables him, with comparatively small trouble, to produce good results. We need scarcely add that the picture should be sharp, well-defined, and as free as possible from stains and spots.

To Colour the Face.—It is well to begin the picture with the flesh tints. Three or four varieties of tone and depth will be required, which are usually distinguished by the manufacturers by numbering them; but as this mode of nomenclature varies, we will describe the colours. In our practice we use four fleshes, and two or three complexions. No. 1 dark and No. 1 fair are extremely pure and delicate tints, suitable for the high lights of flesh, and sometimes for the local colour in ladies and children. The first is somewhat of a cream colour, and the second similar, but a little less yellow in tone. No. 2 dark and No. 2 fair are deeper in tint, and are used for the local colour of the respective complexions to which they are suited.

Before proceeding further, we may remark that a variety of modes of using dry colours have been adopted by different persons. Some colour on the collodion film, and leave it so; others colour thus, and then finish with varnishing; whilst others varnish first, and colour on the varnished film. Neither of these plans gives the best results. The mode we have long followed with success, and which we recommend as securing the most solidity, permanence, and brilliancy, is to colour the picture throughout, or nearly so, on the collodion film; then varnish and colour the entire picture again. In proceeding with the first colouring it must be remembered that the varnish will materially modify the brilliancy and depth of the applied tints, and that therefore they may possess much greater intensity than is required in the finished picture.

Begin with the forehead, using a delicate creamy tint such as we have described as No. 1 flesh. A small portion of colour is to be taken up at the point of a camel-hair pencil, and applied with a light circular motion, commencing on the high lights, and softening gently into the shadows, working well up to the edges of the hair, but taking care not to touch it. With the same tint colour the high lights of the nose, cheeks, and chin. Next proceed to use the local flesh colour, applying it to the remaining portions of the face; commencing as before on the prominent parts, and softening towards the shadows. In doing this, the outlines of the features must be carefully traced, avoiding the deep shadows of the nostrils, eyes, and lips. A small portion of colour must be taken up at a time, and applied with very gentle pressure. The tyro will easily acquire a good method if he endeavour to fancy that the features really possess the relief which their light and shade indicate, and follow with his pencil the undulations which would then exist. Very little colour should be applied to the shadows and half tones—just sufficient to tint without in any degree obscuring them. The retiring shadows of the forehead may be carefully touched with a grey formed of carmine and green mixed to a cold or warm tone, as the complexion may require. The shadows in the socket of the eyes and those of the mouth may be touched with a similar colour. The shadows of the nostrils and of the ear may be touched with carmine, or carmine and dark brown. The lips should be coloured with a tint prepared for the purpose, or with carmine, taking care to preserve their exact form—avoiding the shadow between them. The iris of the eyes, if blue or light grey, may be touched with a suitable tint; but if dark grey or hazel, they are, unless the head be on a large scale, best untouched.

We may here remark that many colorists simply apply a uniform coating of a suitable flesh tint over lights and shadows, and finish by heightening the colour of the cheek with carmine. We need scarcely add that pictures thus coloured are immeasurably inferior in artistic effect to those in which some attempt is made to give both lights and shadows their appropriate tints, and thus to secure depth, brilliancy, and harmony.

(*To be continued.*)

Photographic Chemistry.

WATER (*continued*).

We are familiar with water under three conditions, as ice, liquid water, and steam, and in all three conditions it is still the same substance, a compound of 1 equivalent of oxygen and 1 of hydrogen. Water augments in volume on freezing, and to restore it to its former condition a considerable amount of heat is required; hence the common remark, that it feels colder at the commencement of a thaw than during the frost, is to a certain extent well-founded.

The action of heat on water is to render it *aeriform;* it is converted into a vapour, and in this condition occupies a space 1,700 times greater than when a liquid. Pure water boiling in an open vessel always retains the same temperature, no matter how intense the heat applied, provided the barometer remains at the same elevation. If, however, the pressure of the column of atmospheric air on the barometer be diminished from any cause, and the mercury descends, water boiling at that moment will be less hot than when the rising of the mercury indicates increased pressure of the

atmospheric column; hence water boils at a considerably lower temperature on the top of Mont Blanc than at the bottom of one of our deepest coal-mines. Under the same circumstances, however, distilled water always boils when the mercury in the thermometer attains the same elevation; and upon this fact, together with a similar one observable in the freezing of water, the thermometrical scale is based.

Water, as it is found in a state of nature, is never chemically pure, the nature of its impurities differing according to the ground through which it has percolated; these impurities often rendering it unfit for operations in photographic chemistry. The most youthful photographer knows what hard water is, and this hardness is caused by the presence of sulphate or other salts of lime; the presence of lime it is easy to detect by adding a little oxalate of ammonia; and the presence of sulphuric acid may be ascertained by means of the nitrate of barytes, acidulated with pure nitric acid. In the event of sulphate of lime being present, on adding the first test oxalate of lime is immediately precipitated; and in the second case sulphate of barytes is precipitated, both substances being insoluble.

Under certain peculiar circumstances water may deposit its mineral impurities; hence the formation of deposits, incrustations, petrifactions, and so forth.

Pure water does not act on tincture of litmus; nor is it disturbed by the addition of nitrate of silver, nitrate of barytes, oxalate of ammonia, lime water, or the hydrosulphate of ammonia, which reagents test the presence of sulphates, carbonates, chlorides, lime, or metals. When evaporated on a glass or platinum plate it does not leave the slightest residue; and this is the character of distilled water.

Rain water may generally be employed as a substitute for distilled water in photographic operations, provided it is is caught only after the slates or tiles have been well washed. For washings common water will answer very well, especially if it be filtered; but for the baths containing iodide of potassium, nitrate of silver, and gallic acid, pure water is requisite; although, in case of necessity, river water may be substituted even in these cases, if a few drops of nitrate of silver be first added, and the water then filtered with the view of freeing it from the precipitated chloride of silver.

Neutral Solvents.—Water is employed in photography to dissolve different chemical agents, and to place them in a condition to be transferred to the paper or plate; all bodies capable of dissolving without altering these chemical agents may be likewise employed for a similar purpose; thus in certain preparations, alcohol, ether, and other liquids are employed.

(*To be continued.*)

Dictionary of Photography.

ACTINOMETER (*continued*).—MM. Fave and Silbermann have examined the action of the solar light on a mixture of chlorine and hydrogen, and have employed the facts which they have observed in measuring the chemical influence of the different coloured rays of the spectrum. They filled fifty small glass tubes, placed in an upright position along the sides of a narrow trough—the gases being confined over salt water, whilst they were exposed to the solar spectrum. The level to which the salt solution rose in the various tubes under the influence of light, rendered the chemical action of the coloured rays evident to the eye. Fave and Silbermann state, that they have found the greatest action to take place in the morning at the line H, at noon at the line G, and in the evening at F.

M. Claudet has also devised an instrument which he terms a photographometer, by means of which we are enabled to measure, not only the intensity of the chemical rays, but also the relative susceptibility of the plates or chemical papers, which have been prepared according to different methods. The plate or paper is attached at the lower edge of an inclined plane, and covered with a metallic plate, which is perforated horizontally with a row of equi-distant round holes. A second disc slides along the inclined plane, in which there are corresponding holes of 1, 2, 4, 8, 16, 32, and 64 millimètres in diameter. This second plate is fixed in a black cloth, which moves with it, in such a manner that the rays of light can only impinge upon the prepared plate during the time which the openings of the moving plate occupy in passing over those in the one at rest. It is evident, that the ratios of the periods of operation for the adjacent perforations must be as 1, 2, 4, 8, &c. When a very weak light is employed, as in instituting a comparison between the solar and lunar light, it is necessary to let the moveable plate fall repeatedly, and to calculate the ratios of the intensities accordingly. If we wish to compare plates that have been prepared according to different methods, they must be placed in juxtaposition, and two moveable plates allowed to slide down at the same time, as the intensity of the light varies every minute. M. Claudet has ascertained, by means of his apparatus, that pure solar light renders iodo-bromide of silver susceptible to the vapour of mercury in $\frac{1}{1000}$th of a second. He considers the apparatus adapted to solve the following questions:—What is the effect of the compound light, and what that of the separate rays of the solar spectrum? What is the amount of loss in the chemical rays by ordinary or total reflection, or by refraction through lenses? What is the intensity of the chemical rays in the various sources of light? What influence does the atmosphere exert upon the chemical rays?

Professor Draper has devoted considerable time to the study of the chemical action of light; and more than twenty years ago he commenced experiments, with the view to invent some means for measuring the chemical action of light with some degree of exactness. His first essays were by noticing the degree of blackness which was produced on papers coated with chloride or bromide of silver. He subsequently described an instrument which was well adapted to these inquiries. This he described in a paper published in the *Philosophical Magazine;* and it is from this, and other papers by the same experimentalist which he has communicated to that journal, that the present account of his researches is taken. The instrument, to which he has given the name of tithonometer, consists of an arrangement by which there may be obtained from hydrochloric acid by voltaic decomposition a mixture of equal parts of chlorine and hydrogen. This mixture will remain without change in the dark, but on exposure to the rays of a lamp the two gases unite in proportion to the incident light. So great is its sensitiveness, that an electric spark which lasts, it is said, less than the millionth part of a second, affects it powerfully when at a distance, and sometimes occasions an explosion which destroys the tithonometer. Messrs. Bunsen and Roscoe have recently introduced several improvements and refinements into the tithonometer; and in a paper which they read before the Royal Society, they have brought forward many important discoveries in photo-chemical science which they have been enabled to make by means of this instrument. They belong too much to the domain of abstract science for us to lay them in full before our readers. The apparatus which these physicists have contrived for this purpose is most ingenious; and, although too complicated and delicate for any other purpose than an instrument of pure research, promises to be of the highest importance in all inquiries into the laws which regulate photographic phenomena. Messrs. Bunsen and Roscoe have obtained several remarkable results with their instrument; one of them is, that the presence of a very minute quantity of a foreign gas introduced into their standard mixture of chlorine and hydrogen was capable of offering great resistance to the combination of the gases, a small quantity of hydrogen in excess diminished the sensitiveness by two-thirds, whilst a little more than one per cent. of oxygen almost entirely prevented

combination. Their researches have also shown that the observations of Becquerel, which induced him to assume the existence of certain rays which could continue but not commence chemical action, may be explained without having recourse to the hypothesis of the existence of a new property of light. They have also discovered a very important law governing the chemical combination of a mixture of chlorine and hydrogen, and which it is reasonable to suppose equally well applies to the other cases of combination or decomposition induced by the agency of light, which is, that "for a given amount of chemical action effected in the chlorine and hydrogen an equivalent quantity of light is absorbed." These experimentalists have also noticed that the chemical rays from various sources of light are very different in quality, and that the chemical rays reflected at different times and hours not only possess quantitative but also qualitative differences, similar to the various coloured rays of the solar spectrum; and they conclude their elaborate paper by a reference to the influence which these qualitative differences in the chemical rays exert on the photo-chemical phenomena of vegetation. They state, "that this influence must be of the greatest importance is evident from the varying effects produced in other photo-chemical processes by differences in the solar light." We must only mention, in proof of this assertion, the fact well known to all photographers, that the amount of light photometrically speaking gives no measure for the time in which a given photo-chemical effect is produced, and that a less intense morning light is always preferred for the preparation of pictures to a bright evening light.

(*To be continued.*)

A Catechism of Photography.

WAXED PAPER PROCESS—(*continued*)

Q. What is the chief advantage gained by the employment of waxed paper in photographic operations?

A. The chief advantage of the waxed paper is, that it will keep well in hot weather. It has been urged as an objection to the paper process that the paper will not keep a sufficient time after excitation to answer the purpose of travellers, who are compelled to carry about with them a portable tent, and all the necessary apparatus for manipulation. Such difficulties are immediately overcome by the use of the waxed paper process.

Q. Are there not a variety of methods employed by photographers in the application of the waxed paper process?

A. There are several different plans all founded on the same principles, as in most other branches of photography.

Q. Describe another process from that which has already been stated; what is the first thing to be done?

A. In proceeding to detail another process the first operation is to wax the paper on a sheet of heated iron, and to be careful that the coating of wax is even and regular.

Q. What is the second?

A. The second part of the operation is to immerse the waxed paper in a bath of iodide of potassium.

Q. How long should the paper be immersed?

A. From half-an-hour to two hours.

Q. How is the solution to be composed?

A. To a quantity of boiled whey is added iodide of potassium, 4 drachms; bromide of potassium, 60 grains; sugar of milk, 5 drachms. When the paper is removed from the bath, it is dried between two sheets of blotting paper.

Q. What is the third operation?

A. Sensitising in a bath of aceto-nitrate of silver, composed of nitrate of silver, crystallised acetic acid, and pure water. The paper is floated in the bath for one or two minutes, washed in distilled water, dried between flat surfaces, and exposed in the camera.

Q. What is the fourth operation?

A. That of the development of the negative proof, which is done by immersing it in a solution of gallic acid; after which it is washed several times in pure water.

Q. What is the fifth operation?

A. Fixing the proof. This is accomplished by immersing it in a solution of hyposulphite of soda, washing it again in pure water, and then drying it by the fire.

M. GEOFFROY'S PLAN.

Q. What is the process adopted by M. Geoffroy?

A. In his experiments on the waxed paper process M. Geoffroy hit upon a new and more expeditious mode of conducting the operation; it is called the ceroleine process.

Q. How is the operation conducted?

A. In the first place M. Geoffroy places five hundred grammes (about eighteen ounces) of yellow or white wax in one litre (about a quart) of alcohol of commercial strength in a glass retort, and boils the alcohol until the wax is completely dissolved; having previously attached a receiver to the retort to collect all the products of the distillation, he then pours the still fluid mixture into a glass vessel, and as it cools, the myricine and cerine solidify, while the ceroleine remains in the alcoholic solution; this liquid is separated by straining it through fine linen; and by a final operation it is filtered through paper in a glass funnel. This mixture, kept in a stoppered bottle, may be used when required.

Q. How does M. Geoffroy continue his process?

A. He dissolves five drachms of iodide of ammonium (or potassium) in five ounces of alcohol, together with fifteen grains of fluoride of potassium or ammonium. Taking a capsule he pours drop by drop upon fifteen grains of iodide of silver as much of a solution of cyanide of potassium as is required to dissolve it. This dissolved iodide of silver he proceeds to mix with the former solution, shaking it briskly. There remains at the bottom of the bottle a thick deposit of all the above salts, which serve to saturate the alcohol with which that already saturated is successively replaced.

Q. Having prepared these solutions, how does M. Geoffroy proceed?

A. These two bottles being ready, when about to prepare negatives he takes about six ounces of solution No. 1, of ceroleine and alcohol, and mixes it with five drachms of solution No. 2. Filtering the mixture with care so as to avoid crystals, which spot the paper, he makes a bath in a porcelain dish in which he immerses the paper five or six pieces at a time, continuing to do so until the solution is exhausted. After being taken out, suspended on a hook, and dried, these papers, which are of a very uniform rosy tint, are covered up from dust and kept dry. They are sensitised by nitrate of silver. The development of the image by gallic acid, and the fixing the proof by the application of hyposulphite of soda, are accomplished by the ordinary method, generally following that of LeGrey, to which M. Geoffroy adds fifteen or thirty grains of camphorated spirits of wine to one quart of a solution of gallic acid.

Q. What are the peculiar advantages of the plan adopted by M. Geoffroy?

A. The process according to the formula of M. LeGrey is slow and tedious when compared with that of Geoffroy; and very great care is necessary both in the selection and application of the materials. By Geoffroy's plan the iodising and waxing of the paper are effected in one simple and rapid operation; the absorption is, as may be supposed, very uniform and complete, from the facility with which alcohol penetrates, and that granular appearance which is so objectionable in ordinary waxed processes is avoided, owing to the properties of the ceroleine.

Q. Is the solution of ceroleine in alcohol easily made?

A. It is, and at a cheap rate; and the residue of stearine and myricine may be employed with success for waxing fixed proofs.

Q. Are negative pictures taken by this process equal in every respect to those taken by the process of LeGrey?

4. For the transparency of the proofs, the intensity of the blacks, or the clearness of the whites and half-tints, they are equal if not superior to those taken by any other process.

(*To be continued.*)

Photographic Societies.

PHOTOGRAPHIC SOCIETY.—ORDINARY GENERAL MEETING, 7*th December*, 1858.—R. FENTON in the Chair.

On Tuesday evening last the Photographic Society held the second monthly meeting of the present session. There was a large attendance of members, owing, no doubt, to the announcement that the subject to be discussed was the "Carbon process," about which there has lately been so much noise made. There were several photographs exhibited illustrative of various experiments which have recently been tried by photographers, and communicated to the "PHOTOGRAPHIC NEWS." We noticed also exhibited a series of stereoscopic slides, executed by Mr. Sedgefield, of which we shall have occasion to allude in a more extended notice. They seemed to give general satisfaction, and the remarks which were passed upon them fully confirmed our own views. There were also some photographs exhibited, and we believe executed by Dr. Diamond in Germany—views of places which the novelist Mr. G. P. R. James has rendered familiar to the readers of English fiction—Heidelberg, &c. In the landscapes there was a great nicety of half-tint, and the foliage of the trees was well rendered, although we think that, if the picture had been printed a little darker, it would have been better. There were also some architectural views by the same artist, but of these we cannot speak highly: they lack that fineness of detail in which Mr. Fenton excels, while they were printed so exceedingly dark that the foliage is a mere black mass, utterly indistinguishable. The sites are not so happily chosen as those of the landscapes, and this does much to mar the beauty and interest of the picture.

We would also remark that it is extremely pedantic to describe a picture in the German language. It may be complimentary to the country from which the scenes were taken, but we apprehend that there are many who would be totally at a loss to know what they were about, except through the recurrence here and there of a proper English name, or of that of some well-known town.

We must here again revert to an omission to which we called attention in No. 11, in reply to a correspondent who kindly corrected an error into which we fell in our notice of the last meeting, owing to the absence of any description being attached to some of the photographs exhibited. There were some views by Mr. McCraw, but of these we could gather no tidings, although we *presume* they were specimens of his new ink process, with which readers of the "PHOTOGRAPHIC NEWS" are familiar. There were also some views exhibited by Mr. Elliot, but what they were we are unable to inform our readers. We can only surmise that they were some specimens of a new mode of printing. If so, they lack vigour and brilliancy, being uniformly light, and comparatively indistinct in tone. We can only say again on this subject that we should be extremely glad if the secretary would avail himself of our suggestion, and append to each set of photographs exhibited at the various meetings something descriptive of them, otherwise we lose one half of the good attending the society's meetings.

And now we come to the most painful part of our notice. There were exhibited several portraits, and a view executed by the late Mr. Robert Howlett, he who has been so successful in obtaining the enlarged pictures of the moon from Mr. Delarue's negatives, mentioned in No. 10 of the "PHOTOGRAPHIC NEWS." The portraits were of Mr. Phillip, A.R.A., Mr. P. H. Delamotte; and a grouped picture. They were exceedingly well done, and bore the characteristic neatness and clearness of Mr. Howlett's manipulation. We shall not soon forget his admirable series of photographic portraits of the English artists, and these were even an advance upon them. The architectural view was also one of the most beautiful things we had ever seen. It was a view of the "Palais de Justice, Rouen." There was such microscopic minuteness of detail, and such an admirable arrangement of light and shade, pervading the picture, that we were enabled to inspect in the minutest manner the architectural decoration of this fine building. It no doubt will surprise and pain many of our readers to hear of his death. He was present at the last meeting of the Society, and when we had the pleasure of speaking to him he apparently enjoyed the best health. By his death photography has lost a loving disciple—one who has done much to promote and elevate the art; and had he been spared, he would no doubt have done much more to promote the cause. He was only twenty-seven years of age. The Chairman very feelingly alluded to the deplorable circumstance, and passed a well-merited eulogium upon him as a photographer and a gentleman.

We have in our leader referred to the scene which followed, and will therefore only say that, after a great deal of noise and confusion, Mr. Pouncey introduced himself to the meeting, and commenced a long account of his visit to London on the last occasion, and endeavoured, in a most heavy manner, to be facetious at the expense of the "PHOTOGRAPHIC NEWS." But as that was scarcely palatable, he was called to order by the meeting, and received a sharp and well-timed rebuke from Mr. Malone, for indulging in personalities before a meeting of scientific gentlemen. After much recrimination, and not very complimentary language on the part of Mr. Pouncey, Mr. Malone proceeded to give an able, elaborate, and succinct account of the various photo-lithographic processes; after which Mr. Hardwich offered some experiments, which, by that fatality which generally attends this gentleman's proceedings, were not attended with desired success.

Mr. Pouncey then proceeded to ask the Society to pass opinions upon his own processes, to the disparagement of silver printing; and then, as a wind-up, he asked the Society, at all events, to pay his expenses up to London, which cool request, we need hardly say, was received with loud laughter and ironical cheers.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A MEETING of this society was held on the 1st instant, at the Literary and Philosophical Societies' house, when Mr. Sidebotham presided.

Mr. Mann, the Honorary Secretary, read the annual report of the society for the past year, of which the following is a copy:—

"The Committee of the Manchester Photographic Society, in presenting to the members the third annual report, are glad to be able to state that the debt which had been imposed upon them by their exhibition at the Mechanics Institution has been entirely discharged, and that the Treasurer's account shows a balance in his hands of £13 10s. 1d.

"The meetings of the society have throughout the past session been numerously attended; and much interesting information has been received and imparted in the conversations which usually follow the reading of the paper for the evening.

"The following subjects have been brought under the notice of members in the form of papers:—"On Colouring Photographic Slides for the Magic Lantern," by Mr. Sidebotham; "On the Oxymel Process," by Mr. Mann; "On the Artistic Arrangements of Photographic Landscapes," by Mr. James Mudd; "On the Optics of Photography," by the Rev. W. P. Read; and at one of the meetings the council were favoured with the attendance of Mr. Ackland, who gave some useful particulars as to the lenses of Professor Petzval, and introduced a compact stereoscopic camera with single lens. Professor Roscoe also called the attention of the society to the measurement of direct sunlight, as measured by Mr. Campbell's sun-dial; and Mr.

Dancer, to some curious marginal appearances; and Mr. Noton, to a variable stop contrived by him; and Mr. Sidebotham, to a lens cap for taking instantaneous portraits, and to a contrivance for carrying two or three plates in a small compass.

"The society's illustrations have not been continued, there appearing to be no sufficient demand for such expenditure of the society's funds: the council for the ensuing year will probably devote their early attention as to their continuance or not, or for the purchase of published works of excellence for the society's portfolio, or of instruments for the use of members. The thanks of the society are due to several members for donations to the society's portfolio, which has been further enriched by the replacement of the prints by Mr. Braun which were damaged at the Art Treasures Exhibition, the new set being even finer than the former. The sub-committee appointed in November last to examine the various processes for keeping prepared glass plates, have reported generally in favour of the collodio-albumen process. From the specimens lately exhibited by members, the council are glad to see that their attention is again called to the production of larger pictures; at one time it was feared that stereoscopic photography was engrossing too much of their attention.

"During the past year several subjects of the highest importance have occurred; among these may be named M. Nièpce de St. Victor's discovery of some of the latent properties of light, and Mr. Fox Talbot's new process of Photoglyphic Engraving. It does not appear that many amateurs have taken up the former subject; but the last is one which seems destined to work a considerable change in the progress of photography among the fine arts. In the chemical department Uranium Printing has also attracted considerable attention; and Sir J. F. W. Herschel's discovery of the photographic properties of Junonium seems likely to do the same. Several new processes, or modifications of old ones, have been announced; among these, the principal are Mr. Fothergill's Dry Process, and Mr. Pouncey's method of Printing in Carbon.

"The art position of photography is daily becoming one of more and more importance. Private enterprise, unfettered by connection with any society, has been led to establish an independent journal for its especial behoof. No exhibition of art-manufactures is complete without its photographic department. Books and newspapers are daily becoming more indebted to photography for illustrations. The landscape painter is often under the necessity of resorting to the camera for accurate information of details attainable by no other means. Of portrait painting a recent critique says:—"Indeed portraiture has long ceased to be a distinctive school among us, and the recent inroads made upon its rewards by the wonders of photography, encourage but little hope for its future." It is also of increasing utility to the scientific man in a variety of ways; to the chemist, as a test; to the meteorologist and astronomer, as a faithful recorder; and to the literary man, as an accurate copyist. It has made itself useful to the anatomist and surgeon; and to the microscopist it has laid open an entirely new field; whilst to the engineer and mechanic it has become no less indispensable.

"It seems incumbent, then, upon all practising the art, whether as amateurs or professionally, to do all in their power to advance its progress. Every scrap of information should be carefully stored up, and laid open for the use of all; the greater the freedom with which this is done, so much more rapidly will photography advance to its proper place in the list of useful arts. It will be the duty of your council to further us as much as possible in this object; and they believe that by a combination of energy such as the society affords, much may be accomplished."

The treasurer's accounts were then read, when the report and the accounts were approved of, and adopted by the meeting.

The president stated that Mr. Mabley had suggested to him a process for printing in carbon which possessed much ingenuity, and might prove a matter of great importance. Mr. Mabley said that he felt some diffidence in bringing the subject before the society, as he had at present no satisfactory results to show; but as he believed the proposed method was correct in theory, he was anxious to obtain the co-operation of his experimental brother members.

Having worked at the carbon process of Mr. Pouncey, he was impressed with the difficulties arising from its mechanical principle, he was therefore induced to look for some other source of carbon; and as sugar is readily decomposed by sulphuric acid, the oxygen and hydrogen being in correct proportions for forming water, it appeared that this substance might be employed for the end in view. To a solution of bichromate of potass and gum the sugar was therefore added, the mixture spread upon paper and exposed under a negative, the resulting picture was then washed to dissolve the unaltered bichromate, the sugar on those parts being removed therewith, but remaining imprisoned with the reduced bichromate. The picture was then floated on sulphuric acid, and the decomposition of the remaining sugar afforded a picture in carbon, but unfortunately the tissue of the paper was completely destroyed. The president said that he had that day tried Mr. Mabley's method, and thought there was much promise in it; he stated that if the paper were thoroughly dried before the application of the sulphuric acid, it would not suffer, but would be converted into artificial parchment. Mr. Mabley said that the same principle of operation might be adopted for other pigments instead of carbon, for, by combining a salt in solution with the bichromate, washing it after exposure to light, and then treating it with a reagent, a precipitate would be formed on the altered bichromate, without the possibility of injuring the lights, as one of the elements calculated to form the picture would be removed from them by washing before the other was applied. Mr. Dale remarked that he thought the theory a good one, and commented upon the subject. The president then called the attention of the meeting to the important fact discovered by Mr. H. Young, namely, that pictures could be developed in the daylight—the iodide of silver having been previously dissolved away by hyposulphite; it was considered that this might lead to very important results. Mr. H. Young showed a very good positive stereoscopic print on glass, which he had developed in daylight, and explained how the idea first occurred to him. Mr. Dancer remarked that, if Mr. Young had tried to develop in the dark after dissolving off the iodide of silver, he would perhaps have failed, and that it had been established by experiment, that a picture might be developed in daylight by previously washing the plate in a solution of iodide of potassium. Six large and very beautiful sun prints from collodio-albumen negatives were presented by Mr. Mabley to the society's portfolio.

Mr. Pyne exhibited some carbon prints taken by Mr. Pouncey, and which were considered very good—one being particularly admired. Mr. Dancer, having brought a lantern and the requisite apparatus, occupied the rest of the evening by exhibiting numerous transparencies taken by the members with various processes, most of which showed very beautifully on the screen; and after a vote of thanks to Mr. Dancer, the proceedings closed.

Photographic Notes and Queries.

SEDIMENT IN DEVELOPING COLLODIO-ALBUMEN PLATES.

SIR,—A correspondent of the "PHOTOGRAPHIC NEWS," vol. i. p. 118, signed "Delta," complains of a sediment staining his collodio-albumen plates when using rain instead of distilled water, and for his information I beg to state that neither distilled nor rain water will prevent this deposit, and your advice (judging *à priori* what course bodies possessing gravity should take) would seem, at first sight, to cure the evil. But the plate face up or face down makes not the slightest difference, the deposit will form placed either way; indeed, I have sometimes imagined the deposit to be more dense with the plate face down. The most effective cure is, simply to provide a fine and soft camel-hair pencil, or—what is better, and what I always use—a piece of fine and clean cotton wool; and, during development, the plate must be carefully watched, and from time to time brushed freely and lightly with the cotton wool.

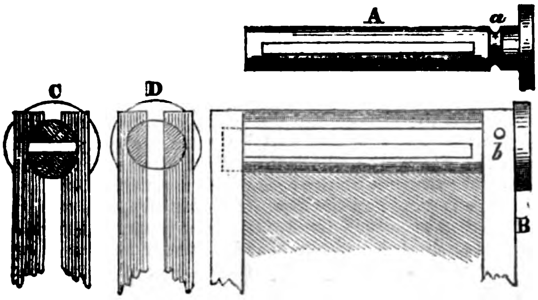
No injury need be apprehended to the negative, as all preparations where albumen is used (being thoroughly coagulated) are very tough, and will bear a good deal of brushing. Should the deposit, through oversight, have formed on the plate, the cotton should be soaked in the developing solution, and rather vigorously used until the plate is clean, renewing the cotton when it gets dirty, as a

further preventative to the formation of deposit. Not more than one drop of silver to the drachm should be used for developing. PETER HENDERSON.

LID FOR NARROW OPENINGS.

SIR,—The accompanying is a description of lid for narrow openings, which I think will be found more convenient and compact, also less liable to open accidentally, than the ordinary slide, which may be used for admitting the plates into the camera back, or on the bottom of the dark box for letting them out.

In the figure A is the lid, the action of which is exactly similar to that of an ordinary stop-cock; it is passed through one side of the box, and enters partly into the opposite one as shown



at B, and is held in its place by the pin *b*, passing across the narrow side of the box so that its side goes into the groove *a* turned on the lid. C D represent the lid shut and open. It may either be made of hard wood or brass; the former answers perfectly well unless the box be very narrow, when brass may be preferred. Perhaps this may be of service to some of your readers. J. W. ROBSON.

STRUCTURELESS COLLODION.

SIR,—In consequence of your observations in a previous number of the "PHOTOGRAPHIC NEWS" on a structureless collodion suitable for the production of microscopic photographs, I have been induced to offer a word or two on the subject.

Some time ago, at the request of one of the principal opticians in this city, I made a number of experiments with a view to arriving at an easy and certain method of making a collodion for that purpose; and if the very beautiful pictures which he produces may be taken as a proof of the success of my experiments, I have no hesitation in recommending the following formula.

The pyroxyline should be made with acids of the strength and at the temperature recommended in my communication at vol. i. p. 122, but substituting papier Joseph for the cotton, and continuing the action for fifteen minutes.

Pyroxyline	4 grains.
Iodide of cadmium	2 ,,
Iodide of ammonium	1 ,,
Bromide of ammonium	½ ,,
Alcohol S. G. ·800	6 drachms.
Sulphuric ether S. G. ·750	2 ,,

The pyroxyline generally dissolves in a few minutes, without leaving a trace of insoluble matter, although I have occasionally found it to require a few hours; in such cases placing the bottle in warm water will immediately effect the desired result.

21, *Dundas-street, Edinburgh.* J. NICOL.

SPOTS ON COLLODION PLATES.

SIR,—Can any of your readers inform me of the reason and remedy of the following?—On taking a stereoscopic picture of the interior of a church or cathedral, small, round, opaque spots frequently occur in the first picture, and sometimes in the second; on taking a second picture in the same position, the same spots occur in the same place on the plate. The negatives are perfect and good in other respects. It does not arise from dust, or long exposure, because pictures of exteriors, or country scenes, taken in dusty situations and exposed equally long, are free from them.

I would give a caution to all operators respecting the keeping of glass plates: never let them remain with pieces of newspaper between them, for, however you may clean the glass afterwards, you can never get rid of the grease which is in the printers' ink, and which is apparent on the plate, immediately after sensitising, in the shape of small and large elongated spots which, when exposed, become on development black opaque lines, which entirely destroy the beauty of the picture. W. H. W.

PHOTOGRAPHIC PROPERTIES OF "HENNA."

MR. EDITOR,—That important photographic chemical, nitrate of silver, has long been employed in this country as a hair dye. In India I believe that a simple vegetable agent is used for the latter purpose, and it is by no means an unimportant question whether it could be employed as an auxiliary in the photographic art.

The Indian plant to which I allude is called "*Henna.*" The powdered leaves, when applied to the hair, produce, by the simple action of light, a brown dye of any required degree of intensity. Under ordinary circumstances I am not sure that the Henna will produce the same effect in this country as in the sunny East—in fact, a specimen I once saw would not—but under the powerful influence of the lens, and, perhaps, in combination with other chemical agents, Henna would form a useful addition to the photographic materia. Perhaps some of your Indian friends could enlighten us on this subject. The chemistry of the vegetable world, with its colouring so gorgeous and yet so varied—and so intimately connected with solar influence—would form a splendid field of investigation to the photographic chemist. SENSITIVE SOL.

MIXED IODIDES IN COLLODION.

SIR,—In one or two communications I have observed that in the directions given for collodion for specific purposes, there has been a combination of the various iodides, viz., in Fothergill's process—iodide of cadmium and ammonium. My own experience discards cadmium, as with it there is a difficulty in getting intensity, but with ammonia it is all I want, being the more easily decomposed salt of the two; therefore, what benefit arises from the combination of cadmium? IODIDE.

[The objection to cadmium salts is, that they tend to make the collodion glutinous, and there is also some difficulty in getting a good intensity with them. Were this not the case, their superior keeping qualities would make them preferable to other less stable compounds in the manufacture of collodion.—ED.]

GLAZE FOR PAPER POSITIVES.

SIR,—"Da Lucem" asks for the method of imparting a glaze to stereoscopic pictures. As the method has been found out by hard labour and numerous experiments on my part, and as it is no secret, I give it to you as follows:—for printing use paper albumenised with *pure* albumen and chloride of sodium, ammonium, &c. &c. (no water as is generally used), print as usual after washing and drying. Float the prints on a bath of *dilute* alcohol and water for three or four minutes, dry, then mount and roll them; next take albumen, whirl it, let it stand for three or four hours, keeping free from dust, until the liquor has drained clear, then with a camel-hair brush (broad) varnish your print, taking especial care only to use the brush one way, and then set aside to dry. W. H. W.

GLASS POSITIVES IN LOCKETS.

SIR,—If you think the following worthy a place in your columns, it is at your disposal.

An easy method of cutting glass positives for brooches, lockets, &c. The picture is focused the size required in the usual way, viz., say a plate $2\frac{1}{2}$ by 2. When the picture is dry, lay upon its surface the glass of the locket or brooch, and mark round by the edge of the bezzle (with any sharp instrument), which leaves the size that the glass has to be cut to; take a diamond and cut the glass square close by the edge of the mark; then cut off the corners. Now take a pair of cutting nippers (watchmaker's), and snip off the edges, until you get it to the proper size. The glass requires no grinding or filing, and may be done altogether in five minutes. G. W. H.

IN PHOTOGRAPHY REMEMBER

That generally more rapid impressions are to be taken in spring—less rapid in autumn.

That materials of dress are better as they reflect more light—*e.g.* silk and satin are better than velvet.

That colourless collodion is quickest—when yellow, give more exposure—when reddish brown, more still.

That more pyrogallic and less acetic acid is required in your negative developing formula in cold weather.

That in landscapes the duller the weather or object, the larger the stop should be—decrease its size as either brightens.

That in washing positive prints, it is change of water, not long soaking that is required.

That positives over-exposed are black and gloomy.

That positives under-exposed are white and misty.

That negatives over-exposed are long in developing, and have no detail in shadows.

That negatives under-exposed are quick in developing, and look reddish.

ANSWERS TO MINOR QUERIES.

GELATINISING POSITIVES.—*C. A. S.* To the best gelatine add cold water, in the proportion of an ounce of the latter to a scruple of the former; place it near the fire, and, when dissolved, strain it through muslin. Take a piece of plate glass, wash it thoroughly, first with water in which common soda has been dissolved, and afterwards with clean water; drain. When dry, adjust it level, and pass over it a sponge dipped in ox-gall, taking care that every part is wetted. Before the gall dries, pour the hot gelatine on the glass, assisting it with a small piece of paper. About $1\frac{1}{4}$ oz. is requisite for a plate 12 inches square. Protect it from dust, and leave it from half an hour to six hours, according to the state of the atmosphere; the precise time may be ascertained by gently laying a finger on the surface, when, if the print of the skin remains in the dent thus made, it has set sufficiently. Lay the picture, face downwards, on the gelatine, taking care to avoid air-bubbles. Should any accidentally appear, they may be stroked out with the finger, applied at the back of the picture. Leave all some hours to harden thoroughly. When perfectly dry, run a pen-knife round the margin, and it will then come off the glass with ease, presenting a highly polished surface, and having the details of the drawing much more distinct than they were before. Pictures thus gelatinised require to be mounted, as they are apt to curl up. Care must also be taken never to touch the polished surface with a warm finger, as the least damp injures the gloss.

TO KEEP A SOLUTION OF GALLIC ACID.—*H. B.* Dissolve 2 ounces of gallic acid in 8 ounces of alcohol (60° over proof); to hasten solution, the flask may be conveniently heated by immersion in hot water; when cold, it should be filtered, mixed with half a drachm of glacial acetic acid, and preserved in a stoppered bottle for use; so prepared, it will keep unaltered for a considerable length of time. The gallic acid is not precipitated from this solution by the addition of water; consequently, if in any case desirable, the development of a picture may be effected with a much stronger bath than the one usually employed. To obtain a solution of about the same strength as a saturated aqueous solution, half a drachm of the above would require to be added to 2 ounces of water; but for many purposes we prefer a weaker bath, prepared by mixing half a drachm with 10 ounces of water. In either case, it will be found necessary to add solution of nitrate of silver in small quantities as the developing picture seems to require it.

MOUNTING PHOTOGRAPHS WITHOUT COCKLING.—*An Amateur* wishes for some information respecting mounting photographs on cardboard. He applies to the back of the photograph a thin paste, made of white starch (a small portion of gum arabic being added to make it more adhesive); when used it is of about the same consistence as the starch used by laundresses. The picture is mounted in the usual way, but as soon as it becomes dry it is sure to *shrink*, or *cockle* as it is called, and no pressure will make the surface level. The cement used by our correspondent is about the best we know, and we should recommend all amateurs to use it in preference to the ordinary flour paste. The cockling is owing to the photograph expanding when damped with the starch paste; and then, on drying, contracting and drawing the cardboard round towards it. This can be remedied either by well damping the cardboard before pasting down the picture, and thus causing *it* to expand equally with the picture, or, better still, by cutting a piece of paper exactly the size of the photograph (and of the same kind of paper), and pasting it on the *back* of the mounting board when the picture is pasted on the face. As they dry, the cardboard will be pulled equally in two opposite directions, and it will act as did the celebrated Captain M'Heath under similar circumstances—the card will obey the pull of neither of them, and will remain perfectly flat.

TO CORRESPONDENTS.

Y. P. S.—Are you sure that the age of the collodion has anything to do with the shrivelling up of the film on varnishing? We have frequently used the same kind of materials without ever experiencing the fault you name.

A. & W. M.—We are obliged by your offer, but we have already seen specimens of the processes you name, and have given our opinions on some of them pretty freely in the last number but one.

A BROTHER.—The hints are very good, and we shall be pleased to receive more of them.

A. B.—The collodion on paper picture was no doubt properly fixed, but the opacity of the paper deceived you.

E. M.—We will endeavour to obtain the desired information.

J. H. E. T.—1. We cannot give you an idea as to what the spotty appearance is caused by unless you give us more information. 2. When a paper positive is first immersed in the hypo. bath it has a peculiar dirty, curdy look by transmitted light, but that gradually disappears on staying in the hypo., and gives place to a delicate, uniform appearance, similar to ivory—the picture is then fixed. 3. We have given several varnishes in recent numbers; that by Sphynx we like best. When your plan of fixing prints is perfected, we shall be pleased to hear from you.

F. SMITH.—It was inserted in the next number.

J. B.—The prints shall be sent. We are much obliged by the enclosed beautiful stereogram. We have forwarded a communication to your address.

WHITE LADYE.—1. and 2. We have described a very good method of argentometry in a recent number. 3. We know no better than the ordinary positive developer such as we have previously described. 4. Metallic Cadmium. We feel flattered by your remarks; it is and always will be our earnest endeavour to deserve being called "The Times" of the Photographic press.

ONE OF DEVON.—We are much obliged by our correspondent's suggestions, but we would rather not be the medium of transmitting the proposal to our contemporary. Would it not be better for our correspondent to write to the editor himself? The use of the copal is to give a *grain* to the plate so that it will hold the ink.

J. L. P.—Further information shall be given as soon as possible.

AGATE.—Newman.

A WOOD ENGRAVER.—In an early number.

J. S. O.—If kept in the bath for more than ten minutes, the picture will be sufficiently fixed.—We do not like them.

H.—We are much obliged by your kind letter; we will give further particulars as soon as possible.

W. HOPPER.—We shall be pleased to be enlightened on the "Dark Process."

A SUBSCRIBER.—1. Yes, if warm enough. 2. Porcelain. 3. Yes.

W. H. W.—If you are as satisfied with your discovery in six months time as you are now, we will, with pleasure, give our readers the benefit of it. At present we are sceptical.

LEREBOUR.—The only way to manage, if you do not wish to make many alterations in your camera, is to have the dark slide arranged for glass plates $3\frac{1}{4}$ inches square, and then take two separate pictures of the same object at the required distance apart. Add a grain bromide of cadmium to each ounce of collodion.

IN TYPE:—R. W.—J. C. S.—C. F. B.—H. C. J.—A Foreigner.—T. Barrett.—Aliquis—One of Devon.—H. T. T.—P. H. O's.—W. H. W.—Stereogram.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. CROOKES, care of Messrs. Petter and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 15.—*December* 17, 1858.

WE are exceedingly reluctant to occupy any further portion of our space in reference to the resolution of the Council of the Photographic Society; and, indeed, we believed it would have been unnecessary, for our remarks were so unanswerable that the Council made no attempt to reply to them in its own organ. We confess, however, that we had a suspicion that one or two of the members, who felt that they were referred to, would seek a less direct method of retaliating on us, and we fear that this suspicion has been realised. We are sorry for this. Had the Council replied to us in an article in the Journal for which they would have been responsible, no matter how illogical the arguments might have been, nor how deficient soever in the graces of composition, the writer would, at least, have confined himself to attacking the "PHOTOGRAPHIC NEWS," and would not have descended to a scurrilous personal abuse of its Editor. We should not have experienced a sense of degradation in replying to the Council; but that feeling we do acknowledge on the present occasion. The attack that has originated these remarks comes from a quarter so utterly obscure, that we will not give the journal in which it appears—that which no doubt it hoped for—the publicity it would obtain by being quoted in our columns. Indeed, we should have refrained from mentioning it at all, and confined ourselves to carrying out our intentions of putting the law in force to punish the libellous attack that has been made upon us; but we owe it to those gentlemen who honour us with their esteem, not to pass by silently charges which directly affect the character of the Editor of this Journal, and consequently it may be said in an indirect manner the Journal itself. We will not enter again upon the question of the right of any public journal to report the proceedings of public bodies, we conceive that question to be completely settled; but we again affirm that we have no sort of ill-feeling towards the Photographic Society. We may not see that it is of any particular use to photographers, or that it has advanced the photographic art in any way, nor, indeed, do we believe it is in its power to do so; but we think that we have shown our willingness to be of service to it, in giving publicity to reports of its proceedings, and we certainly cannot see any method of proving more strongly our good-will. Unfortunately, it happens that the Editor of this Publication was, as all our readers are doubtless aware, the Secretary of the Photographic Society; and it appears to be the opinion of a few ill-disposed individuals, who have the means of making their opinions public, that because he was once in that position he must feel an enmity against the Society he formerly served. He was selected to conduct this Journal in consequence of his reputation as a photographer and a chemist; and it would have been absurd indeed in him if, because he had been connected with the Photographic Society (which connection ceased some time before this Publication made its appearance), he had refused to accept a post so honourable and influential as the editorship of the "PHOTOGRAPHIC NEWS."

In conclusion we will observe that we bring no personal feeling of any kind into these pages. The object of our ambition is to maintain our present position by preserving the character, which the "PHOTOGRAPHIC NEWS" undoubtedly possesses, of being the best and most complete photographic publication in existence, a fact that we conceive to be amply proved by its possessing by far the largest circulation of any journal of the kind—a circulation established in a period scarcely exceeding three months.

It is, perhaps, as well to mention, on the present occasion, that while the Editor fully and freely assumes the responsibility of every article published in this Journal, it is not to be assumed that he is himself the writer of it. The "PHOTOGRAPHIC NEWS" possesses a large staff of contributors; and, indeed, it must be obvious to all who have any knowledge of such matters, that it would be impossible for him to be, in addition to the multifarious and responsible duties appertaining to the editorship of the "PHOTOGRAPHIC NEWS," the author of all that appears in its columns.

TOTAL ECLIPSE OF THE SUN, SEPT. 7, 1858.

WE have before us an abstract of the report of the Commission sent by the Brazilian Government to Paranagua, to observe the total eclipse of the sun on the above date, and communicated to the Royal Astronomical Society by order of the Emperor of Brazil. It is divided into 14 sections, as follow:—

1.—Historical and introductory.
2.—Observations of times of contact, exterior and interior.
3.—Notes on the passage of the moon over the spots and faculæ on the sun.
4.—Notes on the visibility of the moon beyond the edge of the sun.
5.—On the colours of the sky, the sea, and of terrestrial objects during the obscuration.
6.—On the state of the limb of the moon, and on Baily's beads.
7.—On the intensity of the light of the sun near the limb.
8.—On the intensity of the atmospheric light during totality.
9.—On the corona.
10.—On the protuberances.
11.—Photographic observations.
12.—Measures of the distances of the cusps.
13.—Meteorological observations.
14.—Effect of the eclipse on men and animals.

The Commission left Rio about seventeen days before the day of the eclipse. Four stations were selected, including a chief central on the country house of Dr. Reichsteiner,

the Swiss Consul, on the sea shore near Paranagua. The weather seems to have been very unpromising, and rain to have been so frequent previously to the 7th of September, that little hope was entertained of success; but in the event the excellent arrangements made were not frustrated by this cause. Our space is too limited to give an account of the different phenomena observed and classified in each of the different sections; we will, therefore, only allude to the most curious appearances, and to the photographic observations, which, we are happy to say, seem to have been very successful.

4.—In this section several curious facts are recorded. In the early stage of the eclipse both M. de Mello and M. Liais were able to trace the contour of the moon to the distance of from 4′ to 8′ beyond the sun's limb. With one of M. Liais' telescopes, having an aperture of 3 inches, the image was observed by projection on a plate of ground glass, and the image of the moon was thus seen very distinctly, and remarked to be *whiter* than that of the neighbouring region of the sky: this appearance lasted for some time; it then became less marked, and at last was not distinguishable. Some photographs of this appearance were obtained by M. Liais, by the collodio-albumen dry process on glass, in which the effect was distinctly traced while the plates were still wet, on coming out of the gallic acid bath. M. Liais adds some remarks in explanation of the curious circumstances, that both in the photographic negatives, and in the projected positive image, the same effect was witnessed.

6.—The phenomenon of Baily's beads presented itself on both the disappearance and re-appearance of the sun.

8.—Several planets and stars were seen during the totality, and numerical results by Rumford's photometer of the degrees of obscurity are added.

9.—The corona appears, by the accounts of all observers, to have presented, on this occasion, an unusually complicated appearance. More than three independent observers agree in testifying to the appearance of 5 distinct brushes of light, reaching to an average distance of about 13′ from the moon's limb, of the form of a cone with convex sides, the base, equal to two-thirds of the height, resting on the moon. In addition to these were two brushes of white light radiating right and left, and of a thread-like texture; and on the east of the moon there was an emanation of feebler light. The light of the corona, forming the ground on which these brighter portions were seen projected, was remarked to be exceedingly unequal and patchy, and in many places to present the appearance of coarse rays, crossing and intersecting in all directions, but having no very definite exterior boundary.

10.—Several protuberances were also seen during the totality; but they are described as having been of a white colour, and only in one instance tinged with pink. At the commencement of totality three protuberances were found on the sun's east limb; the first two were vividly bright, with a black outline. On the west limb there were seen two others, in which a pink tint was noticeable. In a short time the protuberances on the east side were covered over, and a third one emerged on the west side (making six in all). At one of the inland stations, at Campinas, the two principal protuberances on the west limb were seen to be connected by a low dentelated bank of pink light, which was not uncovered to the observers at the central station. There seems to be no sort of connection between these protuberances and the solar spots and faculæ.

11.—This section is appropriated to an account of the means used for obtaining photographs of the disc, and of the results deduced. The abstract is silent as to all particulars on this interesting point, and we are left in ignorance as to whether any of the remarkable phenomena, recorded in sections 9 and 10, were fixed by photographic means. We are afraid not, since we are informed that 15 photographs only were taken; 9 before the totality, and 6 after, of which one failed to develop, and two others were spoiled by the instruments slipping. The positions of the cusps exhibited in this series of photographs enabled M. Liais to conclude that at the intended central station the centres of the two bodies passed within 1″·5.

THE COLLODIO-ALBUMEN PROCESS.

My Dear Sir,—In compliance with your request, I send a few particulars of the collodio-albumen process as at present practised by myself and many of the members of the Manchester Photographic Society.

As you have recently published the process in the columns of the "Photographic News," I will not take up your space by giving a *detailed* account of the process, which would be, in most respects, merely repeating what you have already written, but will make it as brief as possible; and, to any one requiring further information, I shall be happy to give it through the medium of the "Photographic News."

The plate is to be cleaned in the usual manner; immediately before use it should be rubbed over with a dry warm cloth, and then a large camel-hair brush passed over it to take off the lint.

The plate may now be coated with collodion, and sensitised in the ordinary silver bath. The collodion for the purpose should be not too thick, and allowed to set very well before immersion in the bath.

When the plate has been in the bath sufficiently long, take it out and place it in a dish of clean rain water; then wash it well under a tap, and rear up to drain; then pour on a little of the prepared albumen at the upper edge; run it round to each corner, and pour off; pour on and off a second time in the same manner; rear up to dry on a strip of blotting paper. The albumen is prepared as follows, and will keep good for years if required.

PREPARED ALBUMEN.

Albumen (white of egg)	1	ounce.
Water	¼	ounce.
Liquor ammoniæ	10	minims.
Iodide potassium	5	grains.
Bromide potassium	1	grain.
Solution of iodine (5 grains to 1 oz. alcohol)	2	minims.

Dissolve the iodide and bromide in the water; then add the ammonia and iodine; put this into a basin with the albumen; beat it well up to a froth, and allow it to stand a few hours; then filter through a piece of fine sponge, and put it in a bottle with a small piece of camphor.

When the plate is *surface dry*, hold it in front of a hot fire till it is quite dry and hot. Plates thus prepared may be stowed away in boxes, and, if kept dry, will remain good a long time; if taken in proper rotation in the various operations, no time need be lost, and twenty plates may be prepared easily in an hour.

To render the plate sensitive, immerse it for about half a minute in a bath of aceto-nitrate of silver; then remove to a bath of water; after which wash the plate very well with a stream of water. Most of the failures in this process are occasioned by a neglect of this. It cannot be too strongly insisted upon, that thorough washing is all important.

ACETO-NITRATE BATH.

Water	1	ounce.
Nitrate of silver	40	grains.
Glacial acetic acid	30	minims.

The time of exposure is a matter in which every one must judge for himself, according to the subject, lens, aperture, light, time of year, &c. It is well in all cases to expose sufficiently long, as an over-exposed picture can be made good, but an under-exposed one cannot. There ought to be very few touches, either of pure white or black, in a good photograph. An under-exposed picture gives plenty of both. The picture may be developed either with gallic or pyrogallic acid. I prefer the latter.

Pyrogallic acid	2	grains	filter.
Water	1	ounce	
Glacial acetic acid	20	minims	

Nitrate of silver	10 grains	filter.
Water	5 ounces	

Wet the surface of the plate with water; then pour on some of the pyrogallic solution, with the addition of a few drops of the nitrate of silver; pour the solution on and off a few times; the picture appears rapidly; and density may be easily obtained by adding a little more of the nitrate of silver, if required; wash, and fix with hypo as usual.

Should the film be a little liable to loosen from the plate, commence the developing with a weak solution of proto-sulphate of iron; wash it off; and then proceed with the pyrogallic and nitrate of silver.

Notwithstanding the publication of many modifications of this and other dry processes, I still think the collodio-albumen surpasses all others in the *certainty* and *beauty* of its results.

As to the *certainty*, I may mention, that a member of our Society has often occasion to travel fifty or sixty miles to take large photographs, for legal and other purposes. He takes his camera and a couple of collodio-albumen plates, and develops on his return home; never thinking to take the picture he requires in duplicate, being *quite certain* that his negatives will be exactly what he requires.

As to the *beauty* of the results, I send to-day, by rail, a parcel containing about a dozen photographs taken by this process, by as many members of our Society, and leave you to give your own opinion upon them.—Yours very truly,

Joseph Sidebotham.

[The above process comes before our readers and ourselves from such high authorities, and is the result of so many careful comparative experiments which have been carried on by a committee of the Manchester Photographic Society since November, 1857, that comment on our part would be quite superfluous. With respect to the prints which have been forwarded to us, they exceed anything we have ever seen of the dry processes. Usually, a print from a dry plate is characterised by a certain hardness and exaggerated intensity of contrast; and, however skilful the operator may have been, unless the proper exposure and selection of evenly-illuminated objects have been carefully attended to, this defect will be sure to make itself apparent on the finished print. Here, however, we have all the softness and beautiful gradation of half-tones which we are accustomed to look upon as the distinguishing characteristic of the wet collodion process; and this not merely in some slight degree, but in a perfection which we have rarely seen attained even by wet collodion. The pictures are all by members of the council of the Manchester Photographic Society. They are each so perfect, that it would be invidious for us to mention the name of any one gentleman in particular; but we are sure that we shall only echo the sentiments of the readers of the "Photographic News," when we offer our thanks to the council of this Society for having enabled us to speak so decidedly as to the merits of this beautiful process. We must also congratulate the members of the Manchester Photographic Society in being so far ahead of the Metropolis as to have a council in which a good photographer is not a *rara avis;* a committee capable of understanding and performing its duties; and sufficient sterling common sense to show them, that a narrow-minded, selfish policy, is *not* the one best suited to advance the interests of the science of which they are the professed supporters.—Ed.]

NEW PROCESS OF CHEMICAL ENGRAVING—STEEL-FACING ENGRAVED COPPER-PLATES.

BY E. ROBIQUET.

Photography having made such rapid strides so soon after its discovery, mediocrity in the art can no longer be tolerated. Regarded from the point of view of its correctness, the best designer cannot struggle against the expert photographer, but in point of taste and sentiment it is quite another thing. Far from injuring those who can comprehend nature, photography only gives them the most salutary lessons. The arts of reproduction, such as engraving and lithography, acted upon by this inevitable influence, seem to poetise themselves more and more. We have had an opportunity recently of observing fresh improvements applied to the ordinary processes of engraving by MM. Salmon and Garnier.

Two methods are still pursued to execute an engraving, whether on copper or steel. In the first, termed copper-plate, the artist designs directly, by means of the burin, on the metallic plate the subject he desires to reproduce, and nothing more remains to obtain the proof than to ink the surface in the ordinary manner.

In the second method the plate is first covered with a black varnish, upon which the design to be produced is traced in red. The engraver removes, with an etching needle, the varnish on all those parts of the plate in red; he then bites in the lines traced by means of nitric acid, to a greater or less depth according to circumstances. When the action of the acid has proceeded far enough, the plate is washed with abundance of water, and the remainder of the varnish removed with spirits of turpentine, and the plate remains only to be inked. This kind of engraving is termed etching.

Both these methods require great ability and considerable time; there is besides the danger that the length and nature of the work may lead to a certain hardness in the execution, and detract from the correctness of the reproduction. This danger cannot always be obviated, however great the talent of the artist may be. With the process of MM. Salmon and Garnier, no similar drawbacks are to be feared; it is the design itself which, once drawn on the plate, undergoes a chemical modification which enables it to retain the lithographic ink and to multiply itself *ad infinitum*. At one time this reproduction is obtained in relief, at another time in intaglio.

First Method—Chemical Engraving in Relief.—Everybody knows what English memorandum books are, on the paper of which one can write or design with a metallic pencil (zinc or lead) with the same facility as with a lead pencil on ordinary paper. In the chemical engraving in relief, it is on similar paper, and with a similar pencil, that the design it is desired to reproduce must be traced. This design is then exposed to the vapours of iodine, like a daguerreotype plate, until the lines forming the design have lost their metallic lustre and acquired an orange-yellow tint, due to the formation of an iodide of zinc, with excess of iodine. This image thus surcharged with iodine is quickly applied upon a zinc plate perfectly cleaned, then strongly compressed by means of a lithographic press. The iodide of zinc of the design abandons its excess of iodine to the metallic plate, and thus deposes on its surface a fac-simile of the design itself. A solution composed of lithographic ink diluted in soap water is then poured on the plate, precisely in the same manner as a photographer pours on collodion, and the plate is then washed with plenty of water. Wherever the plate remained naked the ink is washed off completely; but this is not the case with the iodised image, upon which the greasy ink has fixed itself perfectly. It is allowed to dry a little while, and a plate is thus obtained with which one can print proofs on paper precisely the same as with a lithographic stone. When by the succession of proofs pulled the impression becomes faint, a roller charged with ordinary lithographic ink is of course passed over the plate. The relief of the design may even be augmented by immersing the plate in a water bath acidulated with sulphuric acid, which does not touch the greasy impression of the image, and only attacks the naked zinc.

Second Process—Chemical Engraving in Intaglio.—The image being transferred to the zinc plate exactly as in the preceding method, the plate is plunged, not in a bath of dilute sulphuric acid, but in a solution of sulphate of copper, through which a galvanic current is passed, the zinc plate serving as the negative pole. Evidently the copper

held in solution in this new bath will deposit itself on the metallic parts of the plate, and form successive layers of copper upon it, while the parts of the plate protected by the design will remain unaltered. After this action has continued a sufficient length of time the plate is taken from the bath and washed with water. If the operation has been well managed a design will be seen which will have the appearance of being engraved on copper, and which may be employed in printing on paper in the usual manner.

MM. Garnier and Salmon soon saw that by this system their plates were everlasting, for when the surface of copper was worn by prolonged printing, it was only necessary to plunge it anew into the galvanic bath to replace the vanished copper. By reasoning further, they had the happy idea of seeking to protect the plates of ordinary engravings, and they have fortunately succeeded, not by forming on their surface a galvanic deposit of copper, but by covering them, by means of the pile, with a layer of iron. It is this process to which they have given the name of "*steel-facing engraved copper-plates.*" This metallic "varnish" protects the work of the engraver, and alone undergoes the wear and tear involved in printing. As it can be renewed as often as necessary, the last proofs are as satisfactory as the first. To those who may be sceptical we shall content ourselves with replying, that they have not feared to submit to the steeling bath the plates of Henriquel-Dupont, Mercury, Calametta, Beaugrand, Alexandre Jazet, and others.

Not content with these perfections of the old process of engraving, MM. Salmon and Garnier desired to vanquish photography on its own ground, and this is the course they took.

Direct observation had taught our indefatigable inquirers that a mixture of bichromate of ammonia and cane sugar, dissolved either in water or alcohol, and spread over a surface —whether of metal, glass, or paper—formed a kind of varnish highly hygrometric so long as it remained in darkness, and drying rapidly when it has been exposed for a certain time to the light. Without troubling themselves to inquire what was the chemical reaction under the influence of the solar rays, MM. Salmon and Garnier saw in this precise and simple fact an arm capable of overthrowing the processes employed by photographers in the printing of their positive proofs. These processes have been described so many times that it is not necessary we should recur to them. Let us content ourselves with describing the new method we are considering, and let us suppose that it is a question of producing on glass a picture intended to be viewed by transmitted light. To commence this, a liquid must be prepared, in a chemically dark place, which is composed of a solution containing ten parts of sugar-candy and two parts of bichromate of ammonia in five parts of water, which is further diluted with five parts of absolute alcohol, and filtered through paper. This liquid is poured on glass in the same manner as collodion, and dried over a spirit lamp, giving to the plate a continuous rotatory motion, precisely as in the photographic albumenising process. An albumen positive proof is applied on this glass, and the whole fixed in a printing frame and then exposed to the light during a space of time varying from one to ten minutes. The solar rays pass freely through the transparent parts of the picture, serving as a negative, and dry, in these parts, the bichromate of ammonia varnish; while the varnish under the black parts is completely protected from the action of the light, and entirely preserves its hygrometric virtue. The half-tones undergo, as will be readily understood, an action intermediate between the preceding.

When the time of exposure to the light has been sufficiently prolonged, and this can be taught by experience alone, the frame is removed to the dark room, and the plate prepared with the bichromate dried again very gently, and the surface brushed rapidly over with a badger-hair pencil dipped in perfectly dried charcoal powder. This powder attaches itself to all the parts remaining humid; and as its adherence is as much the more strong as the drying action of the light has been more vivid, it results that the blacks of this new design correspond to the blacks of the negative—that is to say, the parts where the light has not been able to traverse. Everywhere, on the contrary, where the solar rays have been able to act freely, the surface will be dried, and it will be impossible for the smallest particle of the powder to adhere. Finally, in the half-tones an effect will be produced which holds a middle place between the whites and blacks. In a word, the picture will be reproduced exactly as it shall have been given, and as often as may be desired. To give it all the fixedness desirable, it will suffice to wash it with alcohol and varnish it. Transparent proofs will thus be obtained of great beauty and sharpness, which rival the most satisfactory proofs on albumen. The future reserved for this process may be imagined when one reflects that in this way every species of design, of engraving or lithography on paper, may be produced by it, on the simple condition of rendering it transparent by a varnish, or by prolonging the exposure to the light sufficiently. This is not all, for any powder, no matter what, may be used to replace the carbon, provided it be insoluble in water and perfectly dry. One may, therefore, produce designs of different colours, or, otherwise, use enamel powder to obtain proofs on glass, which, passed through the fire of a porcelain kiln, will become veritable stained glass. If, instead of executing the design in enamel powder on glass, it is applied to the porcelain biscuit, it will be easy to fix it by fire, and a new branch will thus be created in the ceramic art.

By modifying a little the proportions of sugar and bichromate contained in the sensitive liquid, and using slightly albumenous water as a solvent instead of the alcohol, it will be possible to operate on paper as well as on glass; and proofs may thus be obtained imitating, in a wonderful manner of the finest engravings or lithographs.

Let us now suppose that a man has in hand a photograph taken either on glass or paper, and that he desires to transfer it to a zinc plate to obtain a real chemical engraving either in relief or in intaglio: nothing will be more easy after what we have said, and he will have resolved the problem of seizing nature by means of photography, and of multiplying the proofs *ad infinitum* by means of engraving. Suppose, for example, that a photographer has been sufficiently clever to obtain on paper a clear picture of a horseman at full gallop, or a vessel under full sail, and that it is a question of transferring this image to a zinc plate. First of all the photographic proof must be rendered transparent, by being impregnated with a turpentine varnish, then it must be applied on a sheet of paper prepared with the bichromate in a room feebly illuminated with artificial light, and the two exposed to the action of the solar rays for about ten minutes. This time having elapsed, they must be taken again to the dark room, the photograph taken off, and the prepared sheet breathed on lightly. Instead of producing the image with the charcoal powder, a pencil dipped in finely pulverised zinc or iron must be moved about on its surface, and the details of the photograph which served as a negative will speedily make their appearance. The metallic picture thus obtained on paper is exposed to the vapours of iodine, and then transferred to the zinc plate in the manner described above. The remainder of the process is also described above.

Such are the principal improvements which we have been allowed to inspect, and which appear to us calculated to introduce great modifications, not only in the domain of engraving and photography, but also in the ceramic arts. Let us hope that MM. Salmon and Garnier, after discovering processes as ingenious as easy to carry out, will succeed, as they propose, in applying them on the large scale.

THE business world at Vienna has been thrown into a state of alarm by the discovery that a number of photographic forgeries of bank notes are in circulation. Hundred-florin notes of the Vienna Bank have been reproduced with such perfection, that it requires an experienced eye to distinguish the forged from the genuine notes.

DEVELOPMENT OF AN IMAGE AFTER FIXING.

TOWARDS the close of the proceedings of the Manchester Photographic Society, which we reported in our last number, p. 166, Mr. Sidebotham, the president, called attention to an important fact which had lately been discovered by Mr. H. Young, namely, that pictures could be developed in the daylight, the iodide of silver having previously been removed. The great importance of such a discovery both in a theoretical and practical point of view impressed itself so strongly upon us, that we at once wrote to Mr. Sidebotham, requesting that he would place our readers in possession of the results of some experiments which he had informed us were in progress. Our request has been responded to in the most courteous manner, and we have great pleasure in laying before our readers the following letter. The plate mentioned therein is most remarkable, considering the way in which it has been produced; the effect is that of a slightly over-exposed picture on collodio-albumen; the light parts are very pure, and the half-tones are well rendered. There is, however, a want of density in the dark shades, which, instead of being opaque, have that peculiar greenish yellow appearance which is the characteristic of over exposure. Viewed as an illustration of a fact which bids fair to subvert all our preconceived theories on the subject, this is one of the most extraordinary pictures we have ever seen.

"*Manchester, December* 13*th*, 1858.

"DEAR SIR,—In compliance with your request, I send you an account of some experiments on the curious fact brought before our last meeting by Mr. H. Young, that a sensitive plate may be impressed with an image, the iodide of silver then removed, and the image developed in daylight. A collodio-albumen plate was sensitised and exposed the usual time, then put into a dish of hypo. and well washed, all traces of the iodide of silver having disappeared; it was then taken into a light room and reared up to dry in the window. I carefully examined the plate under the microscope, but could detect no trace of alteration in the film where the latent image was. Three days afterwards I developed the image with the ordinary pyrogallic and silver sollution in a dark room. I send you the identical plate; you will perceive that the image is composed of different shades, varying from yellow to orange brown. This experiment I have several times repeated with a like result, except that the plates were only kept one day before development.

"With plates prepared with collodion merely, or preserved with syrup, I could obtain no image; nor with plates cleared from the iodide with cyanide of potassium. With plates prepared by the collodio-albumen process, and by that of Mr. Fothergill, the results were precisely the same.

"When the film had loosened from the plate, it was impossible to wash the hypo. out, and the image was spoiled by it, and made uneven; but when the film was firmly attached the image was clear, and the lights brilliant. It is needless to say that the above experiments prove very little, but that little is of great interest, and may lead to important modifications in our photographic processes. Yours very truly, "JOSEPH SIDEBOTHAM."

PHOTOGLYPHY.

THE readers of the "PHOTOGRAPHIC NEWS" have already had an opportunity of seeing the last discovery of Mr. Fox Talbot, and we have now to announce that a still greater advance has been made by that gentleman. We have been favoured with some new pictures, which are indeed a great step in advance of those which our readers have already seen.

A view from "Munich, Bavaria," is an exceedingly beautiful and elaborate picture, and one in which there is more half-tone than we have yet seen in any of Mr. Talbot's productions. A view of "Notre Dame, Paris," is remarkable for the softness which pervades the piece, and for the very delicate manner in which the shadows are rendered. There are a number of other pictures more or less different in character, but all bearing the decided mark of progress. An architectural view entitled "The Schools, Oxford" is even more beautiful than any of the preceding. In it there is absolutely all the half-tone which the most fastidious critic could desire. If we may judge of future success by the progress which has been accomplished with the last few pictures, we may with safety predict that Mr. Talbot will soon obtain by photoglyphy alone that which many think is only to be obtained by the help of the engraver. We are the more convinced of the truth of this from the fact, that we have now before us some of the specimens executed by Mr. Talbot in 1813, and the progress from that time to the present is indeed marvellous. Instead of the airy and sketchy pictures then produced, we have now almost perfect engravings.

Critical Notices.

Stereographic Pictures—English and Welsh Scenery. Illustrated by WILLIAM RUSSELL SEDGEFIELD.

WE have been favoured with some specimens of the above-named stereographic pictures, which we are happy to say cannot be concluded in the category of "Questionable Subjects." Photography—and especially stereographic photography—is here in its legitimate sphere, and in its proper application. The views are instructive and entertaining, while, at the same time, there are around them associations of a pleasant character. We scarcely know which to admire most, the landscapes or architectural pictures, because they are both the best in their respective departments. The care with which they are printed, the clearness of the negatives, the nicety of tint, the beauty of the half-tone, and the happy selection of sites, are all characteristics of these stereographs. "The Tubular and Suspension Bridges at Conway, from the Castle," is a most interesting view of this gigantic piece of engineering—one of the boasts of the nineteenth century—which is here given with a striking reality. "The Suspension Bridge" is rendered with all the delicacy of fine wire-work in this small picture, while the land beyond the bridges forms a good background. Glen Lledr, so well known through the large pictures of Mr. Fenton, is equally clearly given in the stereoscope. The boulders, which jut out in the bed of the river, are seen to great effect. "Pont Aberglaslyn, North Wales," is a charming little morçeau of scenery. The rendering of the foliage and the background scenery is extremely interesting; while, almost secluded, we catch a glimpse of the rustic bridge, which materially adds to the general effect. The indentations which floods have caused in the banks of the river are so regular, that they almost call to mind a theatrical scene from the Brush of Beverly. Of all the spots about Pont Aberglaslyn, the view selected by Mr. Sedgefield for this picture is, we think, the best. But the most wonderful of all the views is "The Summit of Snowdon"—not a view from the lowlands, when that king of mountains happens to be clear of the almost perpetual mist which envelopes him, but a view taken not far from the top—showing, in great reality, the dangerous height to which the photographer has attained. On the top we are enabled to see figures standing near the erection which crowns the summit of this lofty peak—the figures, no doubt, of some adventurous spirits who have accompanied Mr. Sedgefield on his photographic tour. This scene is, to us, a striking instance of the great applications to which photography may be put. The view is one of which almost everybody has heard, but which very few have ever seen, except in the fanciful sketches of tourists, or in the still more crude attempts of elementary geographic illustrations:

we have given our readers an opportunity, in the pages of the "PHOTOGRAPHIC NEWS," of seeing some of the difficulties attendant upon the photographer abroad, both in India and Algeria; but here we have some of the difficulties of our own land more forcibly depicted by the camera than they could be by the pen. The last landscape view that we will mention is of a place with which everybody who has ever had a drawing lesson will be acquainted. Who has not heard of the numberless prizes which have been gained for views of "Tintern Abbey," by all kinds of light, from early dawn to brilliant moonlight? The position from which this view is taken is from the Chapel Hill, so that the Abbey lies at the foot of the hill; and directly facing is another hill, which is covered with trees, the most remarkable feature of which is the nice gradation of tint which marks the distant perspective. The details of the Abbey are admirably given. Altogether the picture is an extremely pleasant one. Many of these scenes forcibly recall to our minds a series of admirable views which were taken in Ireland some time ago, and published by the London Stereoscopic Company. The architectural subjects are remarkable for the delicacy with which detail is rendered, the more so as all the views before us are interiors. Every photographer who has attempted in-door photography in any of our ecclesiastical buildings in this country knows, that the "dim religious light," about which poets sing, is anything but favourable to the photographic art, while the too glowing light is quite as objectionable. "The Interior of Exeter Cathedral, with the Minstrels' Gallery," is a nice picture; and the shadows, so difficult to catch in such a way as to balance the colour of the picture, are well given. The same remarks apply to the view of "The Transepts, Salisbury Cathedral;" while in this picture there is an absence of a defect which we have frequently seen in other views of transepts, viz., the strong light which shines in through the window, and causes an unpleasant glare to pervade the picture. "Bishop Fox's Chantry Chapel, Winchester Cathedral," is a carefully executed picture, and shows, with great minuteness, the elaborate architecture of this noble pile. "The Choir and Altar Screen, Winchester Cathedral," is about one of the finest. It strongly reminds one of David Roberts' delightful interiors; all that it lacks is colour, to make it a picture by Mr. Roberts.

Lessons on Colouring Photographs.

COLOURING POSITIVES ON GLASS—(*continued.*)

Colouring the Hair, &c.—Where the colour of the hair is black or gray, the tone of the collodion positive is generally sufficiently near to that of nature, and may, therefore, be left untouched. In all varieties of brown hair, and especially flaxen, golden, auburn, or red hair, colour is absolutely necessary to correct portraiture. Dark brown hair may generally, with advantage, be left until the second colouring, as dark browns are amongst the colours which are generally removed by the application of varnish; but of that hereafter. All the varieties of light hair are, however, best coloured before varnishing. It is somewhat difficult to specify the tints to be used, as some modifications will be found necessary in almost every case. All the various tints of yellow and light brown, either alone or in combination, will at times be required, and in all cases much more intensity and brilliancy than appear natural must be obtained in the first colouring. One example will be sufficient to illustrate the principle on which this must be done. Suppose the picture in the hands of the colorist to be that of a lady with bright golden tresses: select a bright orange tint—the colour labelled "horizon" will answer best—and apply it to the *lights and half-tones only*, avoiding the deep shadows. This done, you will, if a tyro, be probably appalled by the most fiery-looking head of hair you have ever seen. Nevertheless, for the present leave it so; for after varnishing, this fiery hue will have softened into a sunny, but by no means glaring or unnatural, golden yellow. The same principle must be applied throughout in all varieties of light hair. For flaxen hair use a light yellow, either alone or in combination with "horizon." For light brown, use a suitable brown, either alone or in combination with "horizon." By applying the colour with excess of brilliancy at first, and allowing for the modification produced by varnishing, a much softer effect is produced, and one in which the characteristic texture, &c., of the hair is much better preserved, than if much were left to be done in the second colouring.

We have said that colour is to be applied to the lights and half-tones of the hair only, avoiding the deep shadows. All deep shadows should be transparent;* and in the hair especially, the peculiar form of the locks, the texture, &c., would be speedily lost if this point were neglected. In speaking of the deep shadows of a positive, we may as well here make a remark on the mode by which they are generally obtained in glass pictures. A coating of some black varnish is usually applied to the reverse side of the plate to produce the shadows. This is rarely the best method for coloured pictures. It is quite true that all shadow is a departure from colour, and, in uncoloured pictures, black is a very suitable shadow; but it has generally a cold, inharmonious effect in a coloured picture. We prefer, for this purpose, a backing of deep maroon velvet, which warms the shadows, and harmonises with the greatest number of tints used in portraiture, giving generally an especially suitable shadow-colour for the hair.

The Neck, Bosom, Hands, &c.—The neck, the bosom (if it be uncovered), and in most cases the hands, should be coloured with the No. 1 flesh. If a direct vertical light have been used in producing the picture, the heavy shadow of the chin often darkens the neck; this should, if possible, be avoided, as it is at once unpleasing and unnatural. The shadows of the neck and bosom should be cool, and the gradations as soft and delicate as possible; those of the hand and arm may be touched with carmine, with which the divisions of the fingers may be traced.

Draperies.—The mode of colouring draperies varies with the fabric; in good photographs they are often, especially dark draperies, best left uncoloured. The characteristic texture of most fabrics is generally rendered in photography with such beautiful exactness, that in many cases colouring can only mar them. In all cases where colouring is attempted, it is especially important to endeavour to preserve the peculiar texture, folds, &c. as rendered in the photograph. Here, as in the hair, the lights and half-tones only must be touched, avoiding the deep shadows. In colouring silks, the chief point is to keep the shadows clear and transparent, and the high lights brilliant, generally using for this purpose a tint a little lighter than the local colour. In light silk draperies a good effect is often produced by the use of two tints; in this case it must be remembered that where the lights are cool the shadows must be warm: thus, in a pale blue "shot" with orange, the lights will be blue and the shadows orange; in a green "shot" with any tint of red, the lights will be green and the shadows red; and so in similar cases. As a general principle in painting, especially in portraiture, the use of all positive colours should be avoided. The photographic colorist using powder colours is rarely in much danger of violating this rule, as the various half-tones of the photograph to which he applies the colour, have much the same effect, in modifying the brilliancy of his tints, as adding gray

* In the first article of this series, in enumerating the necessary characteristics of powder colours, we referred to their "transparency." This is a term possibly liable to some misconstruction, as entire transparency, in its absolute sense, is not possible in powder colours. We used the word in a modified sense, meaning that approximation to transparency resulting from the use of the purest and most transparent pigments reduced by careful levigation to the utmost degree of fineness. Colours so prepared are sufficiently transparent, when applied to the lights and half-tones of a picture, to tint without obscuring them; but if applied to the deepest shadows of the hair, &c., would assuredly detract from their clearness and depth.

to the colours of the painter. The young colorist will do well, however, to remember that masses of glaring colour have rarely a pleasing effect, and should be as much as possible avoided.

(*To be continued.*)

Photographic Chemistry.

ORGANIC CHEMISTRY.

UNDER the influence of the organs of vegetables and animals numerous compounds are formed, which chemists can analyse, change, and often reproduce in their laboratory. These substances are termed *organic compounds.* The etymology of this term, as is obvious, recalls that of *organised bodies.* We may add to these products a large number of others, which present much analogy to them, though not formed by organised bodies. Notwithstanding the numerous and diverse forms which vegetables present, and the still greater difference presented between them and animals, the elements of which both are composed do not exceed six in number—the difference between animal and vegetable substances being in the proportions in which these elements are combined. The elements in question are oxygen, hydrogen, nitrogen, carbon, phosphorus, and sulphur.

All organic compounds may be reduced to their elements by *destructive distillation*—that is, by exposing them to a high temperature in close vessels so as to collect their products. Thus :—If a man takes a gun-barrel, the touchhole of which is closed, and forces a piece of green wood to the bottom of the barrel, and thrusts that end horizontally into a good coal fire, water will soon begin to issue from the open end of the tube, which will be at first insipid, and then sour, and is, in fact, acetic acid. After this, gas begins to issue from the mouth of the barrel, which may be collected by tying a moist bladder, from which the air has been expelled, over the mouth. If a piece of tobacco-pipe be inserted in the neck of the bladder, and the gas issuing through it be set on fire, it will be found to burn with a white flame; and if burnt in a glass globe containing oxygen, a vapour will be seen to condense on the sides of the globe, and gradually trickle down in the form of water, thus proving that the gas in the bladder contained hydrogen. The gas which will be found in the globe will be changed into carbonic acid.

As we have already said, all organic compounds are destructible by heat, which may be made to reduce them to more simple combinations or to their elements—the regulated action of heat on some of them so modifies them as to produce new bodies. Thus :—If *gallic acid* be heated to a temperature of from 410 to 415 degrees, a new acid is volatilised, which is termed pyrogallic acid. This result is produced by the action of the heat on the gallic acid, leading to the loss of water, or carbonic acid (gallic acid $C_7 H_3 O_5$ heated, gives pyrogallic acid $C_6 H_3 O_3$ + 1 equivalent of carbonic acid, $C O_2$). The new bodies resulting from this species of action have received the denomination of *pyrogenous bodies.*

Organic products are solid, liquid, or gaseous. Some of them, such as acetic acid, gallic acid, sugar, and gum, are soluble in water; others, such as india-rubber, resins, and oils, are insoluble in water. Some of the bodies that are insoluble in water may be readily dissolved in alcohol, ether, different essences, &c., which are termed neutral solvents. The solid bodies of organic chemistry, like those of mineral chemistry, often assume a crystalline shape on being deposited in their solutions, or when they pass, in cooling, from a liquid to a solid state; of these are sugar-candy and stearic acid: others are amorphous—that is to say, are deposited without assuming any form; thus, gun-cotton dissolved in ether gives a homogeneous film, and, fortunately for photographers, does not exhibit the slightest appearance of crystallisation. (*To be continued.*)

Dictionary of Photography.

ACTINOMETER (*continued*).—Professor Draper has also suggested another means for measuring the chemical action of light, and one which will be found well adapted where extreme sensitiveness is not desired. It is by employing an aqueous solution of peroxalate of iron. This substance is of a golden yellow colour, and may be preserved unchanged for years if in total darkness, but on exposure to the light of a lamp, or to daylight, decomposition immediately takes place, and a lemon-yellow precipitate of protoxalate of iron falls down, with evolution of carbonic acid. The effect of sunlight upon this compound is so strong, that the liquid actually hisses with the rapidity of the escape of the gas. The chemical decomposition which takes place will be easily understood on reference to the following equation:—

$$Fe_2 O_3 . 3C_2 O_3 = 2 (Fe O. C_2 O_3) + 2 C O_2;$$

or, one equivalent of peroxalate of iron equals two equivalents of protoxalate of iron, and two equivalents of carbonic acid.

The rays which chiefly affect this solution are the most refrangible indigo and violet rays, the same, in fact, which affect the tithonometer and silver salts in general. In its application to photometry several plans may be pursued:—The quantity of the carbonic acid produced may be estimated either by determining its weight or volume; or a determination might be made of the weight of certain metals—gold or silver, for instance—which the solution after exposure would precipitate.

Several precautions must be borne in mind in experimenting with this body. First, the lemon-yellow protoxalate must not be permitted to incrust the sides of the glass exposed to the light, and thus injure its transparency. Second, the solution of peroxalate must be kept nearly at a constant temperature as its colour changes with the heat, it being at the freezing point emerald green, and at the boiling point brownish yellow. Third, before any carbonic acid can be disengaged, the solution must become saturated therewith; and, therefore, before the quantity of incident chemical rays can be correctly measured by the amount of disengaged carbonic acid, the portion dissolved must be removed either by exposing the solution to heat, or by passing a stream of hydrogen through it.

At the recent meeting of the British Association at Leeds, Mr. Fowler read a paper on a process for the estimation of actinism. He proposes for this purpose a mixture of aqueous solutions of oxalate of ammonia and perchloride of mercury. This when in the dark remains unchanged, but on exposure to light a precipitate of calomel takes place. The details of this process having recently appeared in our pages (p. 63), we will not further allude to it.

ACTINOLYTE.—A comprehensive term proposed by Dr. George Wilson, as applicable to substances on which light exerts a chemical and physical change. He says, in lecturing on the theory of photography: "I have found the word *Actinolyte* very convenient . . . . In its simplest etymological meaning, it signifies a chemical compound analysable into its components by light. I propose, however, to use it in as wide a sense as Faraday's term, "electrolyte" (from which it is borrowed), so as to include chemical synthesis as well as analysis; and in the present state of our knowledge it would be convenient to extend the term to all the substances employed by photographers on which light exerts a marked, sensible change, although it may be uncertain how far that change is chemical or mechanical."

ADHESION, ATTRACTION OF.—The power of attraction which exists between the particles of dissimilar kinds of matter; it gives rise to a variety of important phenomena, and is especially worthy of the attention of scientific photographers, as its powers are nearly allied to that of chemical affinity. A familiar illustration of this force is the adhesion of water to the surface of glass, which is thereby wetted.

The adhesion of the collodionised plate to the glass dipper also depends upon this force. All bodies exert the force of adhesion: between solids it gives rise to a resistance to motion which is known as *friction;* this is greater when exerted between similar kinds of matter, and less between dissimilar kinds. A common means of diminishing the amount of this force is by the interposition of a body whose particles have but little cohesion one with the other, such as plumbago or grease. India-rubber is a body whose great power of adhesion is constantly being made use of by the scientific experimentalist; its power of adhesion to glass is almost perfect, and it is thus commonly employed in the manufacture of plate holders.

(*To be continued.*)

A Catechism of Photography.

M. TILLARD'S PROCESS.

Q. What is the process adopted by M. Tillard?

A. M. Tillard's process bears some analogy to the preceding, and by means of it he has obtained very rapidly some very fine proofs.

Q. How is this process conducted?

A. Into about a quart of essence of common turpentine is placed the white wax, in small pieces, and without being melted. They are left to mix together two or three days, and the solution is then decanted and filtered. Into this filtered liquid a small quantity of iodine is then placed. The iodine is immediately dissolved, and a discoloration of the liquid takes place. If the discoloration is not complete, the solution should be exposed for some time to the sun.

Q. What is the next process?

A. A very small quantity of palm oil, perfectly pure, is added in the proportion of 40 or 50 drops to 100 cubic centimètres* of the liquid. The best method of ascertaining the proportion of oil is to test with a small piece of paper if the grease spot be stronger in one case than in the other. If this be the case no more oil need be added.

Q. How do you proceed?

A. The iodide bath, having been prepared and filtered, is placed in a dish or basin, and the paper is soaked in it until it is thoroughly penetrated. The paper is then dried rapidly, and laid aside for sensitising at another time.

Q. How is the paper rendered sensitive?

A. It is sensitised in a bath of nitrate of silver in the following proportions:—

Water	100 cubic centimètres.
Nitrate of silver	76 grains.
Nitrate of zinc	190 „
Acetic acid	190 „

The paper is washed and dried, as in other processes, and is then ready for use. It may be preserved as ordinary waxed paper.

Q. How is a picture taken by this process developed?

A. It is developed by immersion in a bath of gallic acid, in the proportions following:—

Distilled water	50 cubic centimètres.
Water saturated with gallic acid ...	50 „ „
Acetic acid	190 grains.

to which is added a little of the solution of silver which has been used in the preceding process.

THE ENGLISH WET PAPER PROCESS.

Q. In the preceding processes wax has been stated to preserve for a considerable period the sensitiveness of photographic papers. Furnish some illustrations of the photographic process on paper wherein wax is not employed?

A. Under this head we have the following excellent plan adopted by several eminent photographers.

Q. What description of paper do they employ?

A. The paper employed is generally English.

* One cubic centimètre equals 0·001761 parts of a pint.

Q. What solutions are employed in the preparation of these papers?

A. Solution No. 1 is prepared as follows:—in 3 ounces of distilled water are dissolved 120 grains of nitrate of silver; in another glass capable of holding three ounces of water are dissolved 1,200 grains of iodide of potassium. Into this solution, by slow degrees, gently agitated with a glass rod, the solution of nitrate of silver is added. The iodide of silver is at first precipitated, and the solution next becomes perfectly clear and limpid.

Q. What other preparations are necessary?

A. Another bottle must contain the aceto-nitrate mixture according to the following proportions:—distilled water, 4 ounces; nitrate of silver, 198 grains; crystallised acetic acid, 400 grains. In another bottle must be a saturated solution of gallic acid; and in a fourth, 7 drachms of hyposulphite of soda in a quart of water. All these solutions—with the exception of the fourth, must be carefully filtered.

Q. How is the first solution to be employed in the preparation of the paper?

A. Having procured a board, perfectly plain, and of sufficient size for your purpose, cover it with blotting paper, upon which fasten, by the two corners, the paper you intend to prepare. With as much rapidity as possible apply the solution No. 1, taking great care that it is imbibed by the paper equally in all parts. When you are satisfied of this hang it up by one corner to dry, and remove any drops which may run down to the lower corner by lightly touching it with a small piece of blotting paper.

Q. When the paper is thoroughly dry, what is the next operation?

A. When dry the paper must be immersed for four-and-twenty hours in a basin of pure water; after which it must be dried between blotting paper, and is then ready for the second process.

Q. Is the paper so prepared insensible to the effects of light?

A. It is. The colour of the paper, if properly prepared, is of a pale yellow.

Q. What is the second process?

A. That by which the iodised paper is rendered sensitive. It may be conducted as in the preceding process, namely, by stretching the paper on a flat piece of board, or, what is better still, by the use of a bath of distilled water, to which has been added a few drops of solution No. 1 (aceto-nitrate), and a few drops of solution No. 2 (gallic acid). The prepared paper may be floated on the bath for not more than three minutes, care being taken to remove it immediately any stain appears on the bath. After removal it is dried between blotting paper, and may then be placed in the frame between two glasses. This paper will not keep for any length of time, certainly not more than four-and-twenty hours in warm weather, but in winter it will continue sensitive for four or five days.

(*To be continued.*)

Correspondence.

PAPER *v.* COLLODION.

Sir,—It is reported that Mr. W. L. Smith, at the recent meeting of the British Association, alluded to the waxed paper process as "now generally exploded." The term is a strong one, and perhaps owes its use to the prevalent furore for the more inflammable collodion; but let that pass. As an admirer and practitioner of this "exploded" process I cannot but feel sorry that it does not obtain more notice, and am fully convinced that excellence may be attained by its employment, as, in fact, it may by any process, if perseveringly studied and practised. Whenever the means of rendering paper equally sensitive with collodion (a discovery by no means improbable) shall be arrived at, I have no doubt that it will entirely supersede the latter, and justify

the opinion of French artists, that the future excellence of photography must be looked for in its employment. Until this is the case, the superiority of collodion for portraits, and for the introduction of moving objects, must be conceded; but I feel satisfied that for landscapes of every kind the waxed paper will produce results equally artistic, whilst for facility of manipulation, and for operations in the open air, there can be no question of its superiority. If every photographer would give us the statistics of his practice *out of doors*, and inform us the proportion that his failures bear to his successes, I have little doubt that the prevalent preference for collodion, with its cumbrous appurtenances, would be greatly diminished, and the far more simple and easy method meet with greater favour. The operator with waxed paper is not annoyed by such things as imperfectly cleaned glasses, separation of the picture from its support, blisters, fogging, or ill-behaving baths; to say nothing of the discomfort of working in a tent with the thermometer at fever heat. It is true that he has to spend more time in the exposure, but this enables him to feel more sure that the time so spent is correct; a minute more or less being of little consequence, whilst a second or two may spoil a picture on collodion. Nor is this all; his sensitive surfaces are easily prepared, and will remain so for several days if wished, which, when from home, is no small advantage, whilst the gradual development of his negatives enables him to procure any desired degree of intensity without the necessity of uninterrupted attention. If these remarks should induce any increased attention to this valuable process, and prevent its being altogether "exploded," it will gratify its admirer.

Croydon, December, 1858. ALIQUIS.

CARBON PRINTING.

DEAR SIR,—In your report of the meeting of the Manchester Photographic Society, I see that Mr. Mabley has hit upon a method of producing carbon prints with sulphuric acid. This plan, which I believe to be the most correct in theory, was first suggested by Mr. Johnstone, a very clever operator here, and communicated by me to the editor of one of your contemporaries six months ago; that gentleman has not yet published it, because he did not think it was practicable. An experiment will prove, however, the correctness of the theory, and show your correspondent where he has failed—by using the acid too strong. Take a sheet of paper and coat it with a solution of sugar in gum; when dry, write upon it with a quill pen dipped in *dilute* sulphuric acid; dry, and then hold to the fire. The writing at once will become visible, by the separation of the carbon from the sugar. Carry out this experiment by introducing the bichromate of potash, and expose as a photograph. I believe that, with a little modification, this will prove a good method of printing in carbon.

Birmingham Photographic Society, W. OSBORN.
Dec. 15th, 1858.

PRECIPITATED CARBON FOR PRINTING.

DEAR SIR,—You will find in the report of the proceedings of the Manchester Photographic Society that I threw out some suggestions for a method of printing in carbon. I have not since then had the leisure to experiment further; but one thing arises from it which may, I think, certainly be of advantage, should this process be generally adopted, and which I also mentioned at the Society's meetings. I allude to the production of carbon by precipitation from saccharine and gummy solutions by sulphuric acid; in this state it is, of course, in a finer state of division than any mechanical process can attain.

Yours respectfully, WM. TUDOR MABLEY.

ILLUMINATED PAPER STEREOGRAMS.

SIR,—Can any of your correspondents inform a few country amateurs what is the *best* way to procure the semi-transparent or illuminated stereo. slides on *paper?*

P. H. O's.

Miscellaneous.

THE PHOTOGRAPHIC NEWS ALMANACK.

WE beg to call our readers' attention to the "PHOTOGRAPHIC NEWS ALMANACK for 1859," price 6d., free by post 7d., which was published with No. 14 of the "PHOTOGRAPHIC NEWS." The moderate charge which is made for this work is such as to bring it within the reach of everybody; and the same spirit which characterises the "PHOTOGRAPHIC NEWS," namely, the wish to disseminate useful and important information, alike to the practised operator and the amateur, characterises the "Almanack." It will be found to be of the greatest assistance not only to the private amateur, but also to the professional photographer; to the former, on account of the numerous hints it contains, which, if attended to, will ensure success under the most unfavourable circumstances; and to the latter, for the information on subjects which are so liable to escape the memory. Indeed, we can recommend it as one of the most useful works of reference that the photographer can by any possibility possess, and we flatter ourselves that no photographic library or studio will be thought complete without a copy of this Almanack. In the monthly calendar will be found the days of meeting of all the important Photographic Societies in the kingdom, making it a complete and useful guide to secretaries. The "working hours" for each month, together with valuable hints and suggestions to the beginner, and perhaps the small and unpretending, yet absolutely requisite, maxims at the foot of each page, will be found to be not the least important portion of the Almanack. The *resumé* of the various processes discovered in 1858 will be interesting to all. The list of picturesque spots suitable for photographic excursionists will, no doubt, be much read and consulted in August and September next; while those who are anxious for reliable information in regard to the chronological figures of the art, will have great assistance from the "chronology of photography," which has been compiled from the best and most reliable authorities. These are only a few of the leading features of the Almanack. There is, besides, a mass of miscellaneous information which cannot fail to prove of great interest to the non-photographic reader. We will say no more on the subject, but will leave our readers to judge for themselves of the merits of the "PHOTOGRAPHIC NEWS ALMANACK."

TRANSPARENT ENAMEL PHOTOGRAPHS.—We have recently had submitted for our inspection some specimens of a process patented by Mr. Glover, which possess peculiar features of novelty and beauty. The substance on which they are produced is a white enamel glass, upon which they are printed from glass negatives. They have the peculiarity of being positives by either reflected or transmitted light. As stereoscopic transparencies, they possess exquisite softness combined with great vigour, certainly surpassing transparencies produced by the ordinary process. As positives, they also show great delicacy of tone; the whites being, of course, the pure white enamel, and the shadows the rich purple tone produced by gold toning. An important part of the process appears to be the preparation of the enamel surface, which is slightly granulated or deadened by means of hydrofluoric acid. The effect of this is, that the subsequently applied film, whether of collodio-albumen, collodio-gelatine, or plain collodion, adheres with such tenacity, that washing even with soap and water fails to injure the finished picture. The specimens we have seen are by the collodio-albumen process, printed by superposition, and toned with gold; but there appears to be no reason why any other dry process might not be used, nor indeed why the ordinary wet collodion and camera printing should not be equally suitable. The process, as we have said, is patented; and for further particulars we refer the reader to our advertising pages.

WE have been favoured with an inspection of some glass positives taken by a process which the inventor has chosen, in the most glaring opposition to scientific nomenclature, to be entitled "Electro Enamelled Vitrotype Pictures." It is evidently a process of the alabastrine kind, in which perchloride of mercury plays an important part. The results, we must say, are far more pleasing to our eyes than the name is to our ears. There is a degree of softness about the pictures, which almost reminds one of the beautiful enamels of Essex.

Photographic Notes and Queries.

SPOTS ON COLLODION PLATES.

Sir,—If any of your readers have encountered half the annoyance I have met with from the matter to which I am about to refer, no apology will be required by them for my troubling you with this letter. I hope I may equally trust to your indulgence to admit it in the columns of your valuable publication, as a hint, though possibly worthless, sometimes broaches discussion which eventuates in the general benefit.

"Spots on collodion plates," is a heading so frequently met with in photographic periodicals, that it might safely be stereotyped, and yet, as far as my experience has gone, the hints for their remedy have not always been effectual. "The books" give several reasons for the intrusion of these unwelcome visitors. As far as I remember, they are attributed to—

The collodion being used too soon after mixing.
Impurities in the collodion.
Too long immersion in the bath.
Delay in exposure after sensitising.
Foreign matter accumulated in the bath.
A dirty plate.
Undissolved particles in the development.
Dust in the camera or operating room.

It would be almost presumptuous to add to the long catalogue; but after some experience, I would venture to add one other cause, and attribute them sometimes to the *direction of the light.*

I may be allowed to give my reasons for coming to this conclusion, especially since (as far as I am aware) I have not the advantage of scientific authority for my opinion. I have upon several occasions worked part of a day without any sign of the appearance of the spots; when suddenly, without any change in the manipulation, they have come upon me in clouds. I have then sought for a cause from the source I have referred to. I have changed all my materials; filtering, dusting, and taking every precaution suggested. Still they came; and I have put away my apparatus in despair. After awhile, it occurred to me that, having changed everything without effect, the evil was attributable to something I could *not* change. In short, I considered that the *varying light* had something to do with it. I had this idea from remembering that at a certain time of the day, when the sun was at a point nearly at right angles to my camera, the spots appeared. I thereupon considered that if the obliquity of the rays of light were the cause, shading the camera might have an effect. To do this I adopted a plan for which I am indebted to you (though for another object). I fixed a framework of wood upon the point of the camera, and over this I threw a black cloth, projecting about eighteen inches. This answered my hopes; for when I used it, *I had no spots;* on the contrary, when I removed it *the spots reappeared.*

But, the other day I was fairly puzzled. I was copying an engraving, and plate after plate was literally riddled. I was enabled to accommodate myself to the light, so changed my position to every point of the compass, but in vain. My "black cloth" was powerless. I returned to my old expedient, changing all my materials, one after the other, still without effect. Then it occurred to me that there was something the matter with the light, and I thought it possible that *the pins* with which the engraving was fastened might act as reflectors, the rays playing upon their polished surface, which diverted their direct action. I could not give any scientific reason for this notion; but, at any rate, I thought I would see if there were anything in it. I removed the pins, and fastened down the engraving with gum, looking with some little interest for the result. *My next plate had no spots;* and with the same materials and the same manipulation I have not had their company since.

I make no doubt I have thrown myself open to ridicule at the hands of your scientific readers. Probably "they never meet" with the annoyance I have referred to (a common answer to me when I have mentioned to my photographic friends any difficulty I have encountered). I am not ashamed to confess that I sometimes meet with *unaccountable* annoyances, and I do not hesitate to adopt the most out-of-the-way remedies when I do.

In reply to those who may laugh at my notion that the spots have not always a mechanical, but sometimes what the learned call an "actinic" origin, I would ask them, if I am wrong, what *is* the cause? I am emboldened in asking the question by remembering that in one of your recent numbers, no less an authority than yourself suggested that under one contingency (the formation of nitrate in the bath) nothing was left but to begin *de novo.* But I think you merely threw out the suggestion as the *possible* cause; but if it were not, what then?

However, I only write for information. I am, very likely, wrong. I hope some of your readers will put me right.

"Si quid novisti rectius istis,
Candidus imperti; si non, his utere mecum."

I am, Sir, your obedient servant,

3rd December, 1858. H. T. T.

DRY COLLODION.—SIMPLE LEVELLING STAND.

Sir,—In reply to E. P., I have used both the acids named, but have not found them of any service, consequently, I did not mention either as being required in developing.

I considered that all photographers knew that development would not take place with a washed collodion film unless nitrate of silver was added to the gallic acid. No doubt the best plan would have been to have been more explicit, but by describing the plan I pursue I shall make amends for the omission. Take 1 ounce of a saturated solution of gallic acid, and after first moistening the plate with distilled water, pour off and on, then place the plate on a level stand—pour on the gallic acid, let remain for 3 to 5 minutes (not particular), return to the developing glass or measure; add 4 drops of a 30-grain nitrate of silver solution, let it remain until the picture appears; again return the liquid to the measure, add 8 or 10 drops more of silver solution, pour off and on once or twice, let it remain until sufficiently intense, and wash gently; then clear off with cyanide of potassium, 5 grains to the ounce, and varnish. I consider gallic acid produces finer deposits of silver than pyrogallic acid, although the time occupied in development may be four or five times longer.

I never find a film given to rambling; it is true I do not wash off by means of a stream of water from a fire engine, nor do I pass my finger heavily over the film until it is varnished. Many seem to fancy that development by gallic acid takes such a long time, that it must of necessity be extremely troublesome. So it would be if we required to watch the development as with pyrogallic—but such is not the case. If I were asked to develop a number, say ten or twelve, I certainly should use gallic acid, as it is much less trouble—and the results are better.

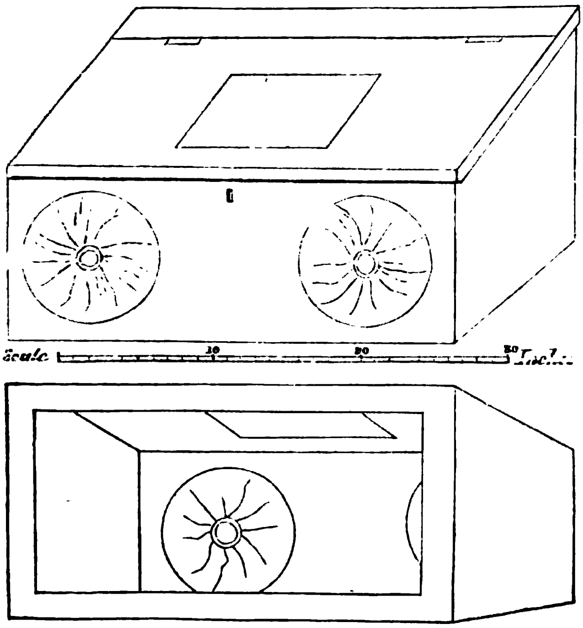
Now, suppose I have returned with the above number of plates, I should go to my dark room, place the number of level stands requisite in a row, moisten the plates, pour off and on the gallic acid, add the 4 drops of nitrate of silver, and pour on to the plates; this would occupy about fifteen to twenty minutes. I next go to look after the other development, viz., of myself—that is one of very great importance; whilst so doing, at mine ease, half to three-quarters of an hour may elapse. I then return to the dark room, and find the picture well out, add the remainder of nitrate of silver, and find my way again to the sitting-room,—read, laugh, chat, or do just the same as the family are doing—merely slipping out once or twice to see how the plates are getting on, and when I find them intense enough, why then my friends will have to "wait a little longer" ere I return. I daresay many will think that to have a dozen level stands

is rather expensive; if I used those usually sold for that purpose, it would be so, but I make a cheap substitute, as follows, at the cost of 2*d*. each:—Let some joiner cut out equilateral triangular pieces of wood, of 5 or 6 inches in the side, and ½ inch thick; make a hole at each corner; obtain some 2½ or 3-inch common screws, at 2*d*. or 3*d*. per dozen; take them to a smith, and have the heads flattened into thumb-bits; screw one into each corner, with plenty of grease, so as to work easily. Place a cup, glass, or any convenient piece of crockery on the stand, and adjust, &c., for developing. ONE OF DEVON.

PORTABLE DEVELOPING BOX.

SIR,—Having frequently had to pull down and rebuild my dark room, I have seen the necessity of a good portable one. I have tried many recommended by various books, &c., but not finding one very comfortable to work with, I was induced to call my inventive powers into play; my success has far surpassed my expectation, for I am now able to work anywhere.

Thinking it might be of use to some of your other subscribers, I have sent a short description of it.



The one I have is made of deal wood, painted inside yellow, the square hole in the top is glazed with orange glass, the round ones in front are covered with black silk sleeves, with a piece of elastic tape for the wrists, the sleeves should be sufficiently long to hang down over the holes. The back I have covered with three thicknesses of yellow calico; in the bottom I have a tin tray to catch slops, and at the back a small tin cistern, with stop-cock, for water.

The dimensions given I find very convenient for all the bottles and measures necessary for manipulation.

STEREOGRAM.

GRADUATED BACKGROUNDS.

SIR,—I see a good deal about backgrounds with light centre. I would recommend the following:—Take unbleached calico, or other suitable substance, and stretch on a frame; take whitening, mix with size, and simmer over the fire; apply this to the centre of the stretched calico, or other material, with a large brush; this will give an intense white; soften this gradually into a dark blue, or some other colour that will give a medium tint. On proceeding to take a portrait (on a sun-shiny day), get some one to hold a large looking-glass so as to catch the sun's rays, and to reflect them back on the white part of the background behind the head of the sitter. The glass must be held somewhere behind the camera, sufficiently to the right or left, so that the reflected light do not come in contact with the sitter. The darker part of the background, on the side which the light from the glass passes, will be something lighter, but with a little judgment this can be turned to advantage. The looking-glass must be kept gently in motion; if a square one, move it in a circular direction. If this be nicely managed, a graduated light can be thrown in behind the head of the portrait—a light of any intensity, falling off in an imperceptible gradation, giving a fine artistic effect.—Truly yours, R. W.

Croydon.

PRINTING FROM A CRACKED NEGATIVE.—TRANSFER VARNISH.

SIR,—In a recent number of the "PHOTOGRAPHIC NEWS" your correspondent wants to know how to print without showing the crack. I have found the following perfectly successful when the negative is not broken in two parts:—carefully clean the varnished side, then pour over Archer's transferring varnish, dry by the fire, and put the negative in cold water; in a short time the film will float off the broken glass in the water; do not touch it with the warm fingers, as it is apt to contract slightly; take another plate of glass, the same size as the broken one, and put it in the water under the floating film, gradually raise the plate to the surface, and the negative on it; let it drain; put it in a pressure frame with a few folds of blotting paper, to press out any remaining water, and the negative will be as perfect as before broken if nicely done. We have several that have been constantly printed for four years past. Archer's transfer varnish is made by dissolving some pure gutta percha in benzole; it must be made rather thick, and should be applied to a warmed negative instead of warming the solution as before recommended, as the latter method renders the varnish useless after a few applications. If you think the above worth a place in your valuable journal, my brother photographers are welcome to what has been of great value to me.—Yours truly, H. D. FRANCIS.

THE INK PROCESS.

SIR,—In vol. i. p. 155 of your valuable journal, is a letter from Mr. M'Craw respecting the Ink Process of Mr. Perry, at the conclusion of which he asks the question whether there are any patents affecting this process. In reply, allow me to inform him that Mr. Perry's patent *now in force* was taken out early in 1856, and that under its protection I took some hundreds of pictures, at least twelve months before M. Sella made any communication on the subject.

The specification of the patent in question was published in a contemporary—I think, some fifteen or sixteen months since, the same journal, in fact, in which I claimed the discovery on behalf of Mr. Perry, and therefore I am surprised it should have escaped Mr. M'Craw's observation.—I am, sir, your most obedient servant, J. SHARP.

28, *Old Bond-street.*

VARNISH FOR NEGATIVES.

SIR,—As I see a good hard varnish is much required, I think the following would answer very well:—

Alcohol	2 ounces.
Copal	½ drachm.
Camphor	20 grains.
Mastic	15 grains.

The copal, finely pounded, should be added to the alcohol, with the camphor and mastic previously dissolved; let it remain three days in a warm place, shaking occasionally. It requires the plate to be warmed, and dries so hard that the finger-nail scarcely marks it. H. C. J.

[We thank our correspondent for the prints, and shall be glad of further particulars.]

ANSWERS TO MINOR QUERIES.

TESTING A LENS FOR SPHERICAL ABERRATION.—*An Optician.* Point the camera at a very small, bright object, such as the image of the sun reflected from a convex glass surface, and get it into proper focus. Now move the lens to and fro in order to throw the visual image on the ground glass alternately within and without the focus; the bright point will expand into a luminous disc, and if it shows a firmer margin *within* than at an equal distance *without* the focus, it is under corrected for spherical aberration, and slightly over corrected for colour, as all photographic lenses should be. If any colour be visible, it should be merely a slight fringe of blue within the focus, or red without.

THE ALABASTRINE PROCESS.—*W. Keith.* Our correspondent has drawn our attention to the following formula for the above process recently communicated by "J. B. R." to another journal:—Take a picture in the usual way, and after fixing, lay it in a dish containing hot water, and let it remain there about three minutes; then take it out, and wash with cold water, drain a short time, and place on a levelling stand; now pour on the re-developing solution, composed of—

Distilled water	1 ounce.
Saturated solution of perchloride of mercury in hydrochloric acid.	12 minims.
Protosulphate of iron	20 grains.
Nitrate of potassa	12 „
Alcohol	½ drachm

On the first application of the solution the picture will almost disappear, and then gradually become more and more developed. Let it remain in this position until you have gained the desired effect, which will take from twenty to thirty minutes; then wash thoroughly with water, and dry by the fire. Our correspondent has sent us a very beautiful specimen of his success with this process, and, we must say, it equals anything we have ever seen of the kind. He advises not to use a spirit varnish, as that turns the picture into slate colour. Amber and chloroform varnish answers admirably. The picture must not be backed up with black varnish, but black velvet, or another glass blackened. Our correspondent also states, that he has found an advantage in dissolving the perchloride of mercury in a solution of chloride of ammonium instead of hydrochloric acid, as the film is not so likely to peel off.

THICKENING POSITIVES WITH CHLORIDE OF MERCURY.—*A Learner.* The plan which you ask for is one which was recommended some years ago by Mr. Maxwell Lyte. He proposed to pour over the picture a mixture of one part of a saturated solution of perchloride of mercury in hydrochloric acid, and six of water. Allow it to remain until whitened, and then wash well, and pour over the plate a solution of iodide of potassium, about 2 grains to the ounce. By this means a dense yellow negative is produced.

YELLOW BOTTLES.—*H. M. T.* Several of the chemicals used in photography should be kept away from the light. We had bottles made some years ago which were flashed with a dark orange colour, and in these the silver bath, collodion, aceto-nitrate of silver, &c., were kept. They have since given us every satisfaction, and we can recommend them to our readers. At that time the bottles had to be made on purpose; but at present there is hardly a photographic warehouse of any note in which they are not kept. Of course our readers will be well aware that the dark purple bottles in which druggists are in the habit of keeping substances on which light exerts a deleterious action, are worse than useless, as they are apt to mislead. *Light* alone is obstructed, whilst the actinic rays pass freely through.

TO CORRESPONDENTS.

OUR correspondents will find it advantageous to sign with the initials only. Letters from "A Correspondent," "A Subscriber," "A Novice," &c. &c., are so frequent, that difficulties may arise in identifying the proper answers.

F. Y.—We hope to be able, in an early number, to lay before our readers some important particulars on the point to which our correspondent alludes.

A NEW SUBSCRIBER.—The objection to single lenses for photographic purposes is, their comparative slowness. We have, however, taken excellent portraits in the summer in a few seconds, by means of a single lens 3½-inches in focus, and ¾ in diameter, with a ¼-inch stop in front. Your other query has recently been answered.

R. W. F.—We prefer stereoscopic transparencies taken on the ground side of the glass plate. No change should take place for a minute or two when the developing and silver solutions are mixed, if they are made with pure chemicals, and mixed in a perfectly clean vessel, and kept in the dark. Try the collodio-albumen process.

SUBSCRIBER AND AMATEUR.—We have the article ready, but want of space has compelled us to defer its publication for the present number.

X. Y. Z.—We cannot recommend any particular make of collodion. C... our advertising pages, where announcements of some of the best collod... we have ever used are to be found. To speak more definitely than ... would be unfair to other makers.

H. M.—Add a few drops of glacial acetic acid; that will most likely rem... the fault.

H.—We have delayed answering your letter of inquiries in the hope ... obtaining some important information on the subject. This we hope to g... shortly.

A CONSTANT READER.—A double convex achromatic lens of 2½-inches d... meter and 12 inches focus will not properly cover a field more than 8 inc... square. To cover 12 inches square it should be 18 inches focus, and 3... diameter.

A TYRO, BRISTOL.—The reason of the present slowness is on account of the l... not being so good as in the summer; and, also, because your rooms are cold and damp. The term *film* is applied to the layer of collodion which ... on the glass; it is used indiscriminately whether before or after immersion in the bath, or after fixing. Do not pour the developing solution so much on one spot; let it gently flow over the plate with a wave-like motion. Your former letter did not reach us.

ASMODEUS.—15 grains of iodide of potassium to the whole quantity. The fault of bronze-like markings does not seem to be confined to any particular make of paper. We hardly understand your last question.

P. S.—1. More applicable to positives. 2. Gelatine, 128 grains; distilled water, 14 ounces; absolute alcohol, 2 ounces, made sufficiently hot to keep liquid.

F. VINCENT.—1. Very difficult, as there is a great tendency to fog. 2. If you do not object to the reddish colour, the toning bath may be dispensed with. 3. Try a 50 grain bath, and have it slightly warm.

A NOVICE.—1. A twin lens stereoscopic camera has the advantage of taking the two pictures simultaneously. 2. We cannot give you more information than can be found in our back numbers.

W. E., EDINBURGH.—1. Instantaneous photography depends more on the light and lens than upon the collodion. 2. We intend to have as perfect an index to each volume of the "PHOTOGRAPHIC NEWS" as possible.

REUBEN.—Try the printing process given in vol. i. p. 86; and the notes on it at vol. i. p. 143.

P. J., AND G. A. S.—We do not know whether the patent for the photogen is merely for the lantern, or for the composition, or for the process of taking portraits by it at night. And therefore we cannot say whether it would be an infringement if you were to use any of the compositions we have previously given, in a lantern of your own contriving. Perhaps some correspondent will favour us with information on this point.

J. L. F.—1. Several weeks if kept from a strong light. 2. About an hour: the length of time the bath will keep depends upon how hard you work it. Some operators make a fresh bath every day, others use one for some weeks. The quantity given will serve for about 30 prints 8 × 10. The print received is very good, and speaks well for future success. A trifle longer stay in the gold bath would have removed the reddish tinge. 3. We do not think the prints need be printed so very much deeper than the desired colour; but experience will tell you better than we can. 4. It is not so manageable. The gold does not last so long, and the prints are very liable to fade.

J. L.—We shall be very pleased to see a description of your portable tent if you will favour us with it.

J. F. WILSON.—We are much obliged for your formula for the varnish. Will you kindly favour us with the address of the house where the article mentioned may be obtained?

ALB. COL.—See paper in the present number.

DUN. EDIN.—We will endeavour to remedy such an inconvenience occurring again; now, however, we cannot do anything.

E. M.—1. See answer above. 2. Yes. Peroxide of iron is the same thing as rust of iron.

L. L.—Add more nitrate of silver to the bath.

TETRATHIONIC.—Try the alabastrine process.

A NOVICE.—1. The recovery of silver from an old bath and its subsequent conversion into nitrate, are not easy of performance by persons unaccustomed to chemical operations. To such we should recommend the plan of selling the reduced metallic silver and purchasing fresh nitrate. The loss of tradesman's profit will be less than the loss of manipulation. 2. Hang three or four penny-pieces in a jug of the solution by means of copper wire. It need not be done in the dark. See our directions at p. 86.

A NOVICE AND SUBSCRIBER.—Your glass-room has too much wood about the sides and roof; it is, in fact, only a wooden room with a large window. Try a southern aspect in your particular case.

OLD HYPO.—We are much obliged for having our attention called to the subject; it shall be attended to. Add sheets of clean metallic zinc to the old hypo. bath, it will precipitate the silver.

J. D.—See the remarks on the subject in this number.

S. D. S.—See answer to Lerebour, p. 168. To take landscapes with a portrait lens, put a small stop in front of the front glass. It will not do so well, however, as a single lens.

H. S. L.—Your ideas are excellent, and we shall have great pleasure in giving them the publicity of our columns. They will prove invaluable to amateurs. They, however, arrived too late for the present number.

A SUBSCRIBER.—We have attended to the agency matter, and shall be very pleased to forward the views of your society in any way in our power. Will you send us the name of the secretary.

Communications declined with thanks:—C. S. W.—J. S.—T. P.—T. B.—Anticritic.—Frank.—W. X.—St. J.—A Subscriber.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "PHOTOGRAPHIC NEWS:"—J. C. G. W.—W. F. W.—R. C. J.—J. W.—L. F.—Mg. O. NO_5.—J. Morel.—A. T.—Nitrate.—Roscoe.—J. T. S.—Amateur.—A Subscriber.—Novice.—X. Y. Z.—J. J. J.—James.—F. W. W.—Tyro.—No. 10.

IN TYPE:—J. T.—T. Barrett.—An Amateur.—A. Horan.—X.—H. H. J.—S. S. B.—J. C. S.—C. F. B.—A Foreigner.—W. H. W.—H. T. T.—Viator.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. CROOKES, care of Messrs. Petter and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

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THE COMMERCIAL USES OF PHOTOGRAPHY.

WHILE every day brings forth an alteration, and every now and then an improvement, in the various photographic processes, and photography, artistically viewed, is continually approaching perfection, it is somewhat surprising to notice the neglect with which that portion of the art, which may ultimately turn out to be really the most useful part of it, has been treated.

We now and then hear of a photographic copy having been made of a bank note, by way of curiosity, or a facsimile taken of some ancient manuscript or some such object; even of a photographic copy of a deed having been accepted in court of law as legal evidence; but the only step hitherto made towards applying the art to the general purposes of everyday life appears to be the reduction in size, by photography, of large maps to a smaller scale.

It is, perhaps, somewhat unfortunate that the first commercial application of the art should have been this, as an obvious objection presents itself on the surface; namely—that in reducing the size of an ordinary printed map, we reduce the size of the lettering also; so that to make a map, containing the required fulness of detail, of a portable size, the names of the various places must be so far diminished in magnitude, as to cause the searcher after the required city or mountain to inquire with Pope, "Why has not man a microscopic eye?"

This objection, however, is not insuperable. Should it ever become, and there is no good reason to the contrary, a general practice to publish reduced portable maps, of such a size that an ordinary pocket volume may contain an atlas of sufficient fulness, why should not a magnifying glass of adequate power accompany each volume, and form, in fact, an essential part of it? The two together can be made so as to be quite portable. Every wearer of spectacles does in fact carry a magnifier to enable him to read that which without it would be unreadable; and why should we not *magnify the spectacles?*

But, passing by this, which is only one end to which photography may be applied, let us turn our attention to the more ordinary things of daily use. In many businesses it is very desirable to have accurate patterns of the articles dealt in. To have these patterns engraved and printed would amount in some cases, where the article is low priced, and intricate in design, to more money than it would be worth while to expend. Take, for example, designs in lace, embroidery, and similar things. Intricacy in pattern is no greater difficulty to the photographer than simplicity, and dealers in this description of goods might find it answer their purpose to prepare illustrated catalogues of their patterns for transmission to customers.

Gentlemen in the country could select for themselves, as easily as they could examine a book, the kind of piano-forte or side-board they require from their musical instrument makers or upholsterers.

The utility of such catalogues to exporters to the Colonies or foreign countries, is obvious at once; in fact, the above propositions have already been adopted in the case of agricultural implements by some of the most eminent manufacturers of those articles.

In taking the outlines of coasts, the bearings and distances of land-marks necessary to be observed in entering harbours, representations of the form of lighthouses, beacons, &c., photography may be made a readily available means of contributing to the safety of life and property where shipping is concerned.

To the architect and railway engineer, an easy and accurate mode of information as to the progress of his works is here given him.

The merit of first employing photography for this purpose is believed to be due to the late Emperor Nicholas of Russia, who by this means got his information of the progress of the bridge of Kiew.

On the occasion of a late accidental fall of some portion of the works on a railway in progress of construction, the contractor, who was obliged to set to work at once to repair the damage, took the precaution, before he commenced operations, of having photographic representations of the state of the ruins taken. In the law-suit, which in all probability will result, what other evidence will supply the place of these truthful representations? How much clearer will the matter be made to the jury by the inspection of these infallible records of the actual appearance of the damaged works, than by the contradictory evidence of a dozen persons, all of whom most likely have a bias one way or the other.

Useful, however, as these applications may be, they are limited compared with the wider field presented to us when we descend to humbler pursuits. In the conduct of ordinary business, all the writing and book-keeping required therein conduces nothing to profit; in fact, is in itself as much a loss as the friction which cannot be got rid of in the working of machinery, but which absorbs and wastes so much of the actual motive power.

Cannot something, then, be done by this art to lighten the labours of the merchants', tradesmen's, and bankers' clerks? Why might not accounts current and similar documents be copied photographically? Why should not the merchant, who sends out his duplicate letters, invoices, &c., &c., by different ships, copy the original by photographic means, and make the sun do for him, with unfailing accuracy, that which at present has to be done either at the expense of much clerk's time, with risk of error, or by the very inferior means, compared to photography, of the copying press, which cannot be applied to anything but unbound and loose sheets? Wills, settlements, deeds, conveyances, and other important legal documents, ought always to have photographic fac-similes taken; reduced, if wished, to a microscopic minuteness, and duplicate copies printed and lodged in separate places of safeguard, to mitigate, in some degree, the serious inconveniences and loss which would be occasioned by a destruction, by fire or otherwise, of the original document. It is needless to multiply examples as to the kind of documents to be copied. The advantages of a method, accurate as the copying press, and as legible as ordinary writing, must be obvious to every one.

Might it not also be satisfactory, in these days of "cooked accounts," to shareholders and others, to have placed in their hands, not merely a printed copy of balance sheets, &c., but their *fixed shadow*, with the auditors' signatures, just as they stand in the original document itself?

And supposing, as we have no hesitation in saying will soon be the case, that these copies can, when a number is required, be produced with almost equal cheapness to a printed or lithographed copy, will not they be so infinitely superior in every other respect as to admit of no comparison as to their desirability?

They can, by Mr. Talbot's recent discovery, be even taken direct on to a copper or steel plate, and from that printed in the ordinary press, removing thereby any objection on the score of slowness of production.

No doubt objections can be made to these propositions; but objections have invariably been made to any improvement. When the electric telegraph was first introduced, few people believed that it would become so generally useful as it has since been; and when once public attention is fairly fixed upon the ordinary commercial uses of photography, there can be little doubt but that that art can be made as beneficial to persons engaged in business, as electricity has now proved itself to be. Very shortly after the first electric telegraph was brought into operation, a gentleman of our acquaintance proposed to a leading joint stock bank in London, having branches, where he was then employed, to connect those branches with the head office by means of telegraphic wires. He was, of course, laughed at as a visionary; but a firm, who do not bear, in commercial circles, the character of visionaries, have since found it expedient to connect their two establishments at opposite ends of the town by means of over-house wires, and, according to their own report, have found their account in doing so.

In the same way, it may appear to many commercial men useless or impracticable to operate in the way proposed with accounts and documents with which they are daily concerned. If the foregoing propositions prove to be of a useless or impracticable character, they will never be carried out; but if not, an impulse will be given to photography, and an extended field to those engaged in its practices, which cannot fail to be beneficial alike to them, and to every person engaged in commercial pursuits, throughout the whole of the civilised world.

DRY COLLODION PROCESS ON PAPER.

BY M. CORBIN.

[The following paper was communicated by M. Corbin to the French Photographic Society, and a committee appointed, consisting of MM. Bayard, Alfred Coulon, Paul Gaillard, and Gabriel de Rumine, to inquire into its merits. It was ordered to be published in the bulletin of the Society.—Ed.]

Last year I made known the results of my experiments with dry collodionised paper. I stated, that to obtain collodionised paper, giving proofs as pure as the collodion on glass, it was necessary so to operate that the collodion should form a completely independent film — the paper simply serving as a base of support, the collodion alone containing the image. I added, that a dry collodionised paper, fulfilling these conditions, might be obtained in the following manner:—

Iodised collodion is poured on a glass plate; then nitrated, and deprived of its sensibility by washing with the iodide of potassium; it is then transferred to gelatinised paper; and finally covered with a preservative film, and suspended until dry. The paper might be preserved indefinitely. It was sensitised at the moment of using it or some days previously.

I saw that the nature of the preservative film was of great importance to the success of the process. I made my first essays with gelatine. I poured on the paper, covered with collodion, a dry solution of gelatine, and left it to dry. To use the paper, I laid it on a very weak nitrate of silver bath (2 to 3 parts of nitrate to 1000 of water); I washed it, applied it on a glass, and exposed it, wet as it was, in the camera; I developed with gallic acid strengthened with aceto-nitrate of silver. I obtained, in this way, sufficiently good results, but, on the other hand, I met with many failures. The quantity of gelatine which remains on the surface of the collodion has a great influence on the proof. Now, this quantity depends on the greater or less rapidity with which the gelatine film solidifies, and in consequence on the exterior temperature. From this especially arises the inconstancy of the results. Beyond this, it often happens, that the collodion is penetrated by the gelatine in an uneven manner, which occasions spots in the proofs.

I have attempted to employ my sensitised paper in a dry state—that is to say, to suffer it to dry after being sensitised, and, in this condition, to expose it in the camera; but the proofs obtained in this way were very feeble on development, and the whites rapidly disappeared.

I then employed albumen, in lieu of gelatine, in the same manner. The sheet being dry, I sensitised it; washed, and exposed it in a humid state in the camera. The proofs I obtained on developing were gray in colour, and without vigour, and the whites faded away. In a dry state I obtained even worse results.

Why does the albumenised collodion process, which succeeds so well on glass, not answer when the collodion rests on paper? This fact arises from different causes. The paper, being permeable, absorbs a portion of the albumen, and an insufficient quantity remains between the particles of collodion to preserve their photogenic properties. Besides, it is easy to conceive, that the collodion lying on paper may, in drying, undergo a diminution of temperature, and the consequent contraction be greater than if it dried on the glass on which it was poured; it participates also in the contraction of the paper. Now, it is precisely this contraction which collodion undergoes in drying which deprives it of its photogenic properties, and which it is sought to obviate by interposing albumen between its particles.

I mixed a volume of honey syrup with the albumen, and the inconveniences enumerated above disappeared. The albumen, brought by this means to a syrup-like consistency, was no longer so easily absorbed by the paper; and, in consequence also of its possessing less fluidity, a larger proportion remained on the surface of the collodion; also, the honey prevented the complete desiccation of the paper: although it did not prevent it from becoming dry enough to be placed in a portfolio, and to undergo the unavoidable friction without alteration; still it preserved a certain humidity, which much diminished the contraction of the collodion. Finally, in consequence of the solubility of the honey, the sensitising liquid penetrates more easily in the collodion.

A paper thus prepared yielded very fine proofs, on the condition of not allowing it to dry between the sensitising and the development. If it were employed in a dry state, it gave only proofs which were gray and without vigour. . . . . I tried to modify this process so as to allow of the paper being used in a dry state. I covered the paper, which I had prepared with the honey and albumen mixture, with a second preservative film, in this wise:—I allowed it to dry, and then laid it on a gelatine bath, and dried it anew. In this way I obtained a paper which could be very well employed in a dry state, and which yielded me a certain number of fine proofs: but this gelatinising complicated the process, and the gelatine film, which ought to be very thick, is difficult to apply, so that I was under the necessity of seeking a method of simplifying it. The attempt to replace this film of gelatine by albumen was a failure.

After numerous essays, I found a process entirely satisfactory, dependent on the preparation of a new collodion. I remarked, that the old red collodions, containing free iodine—gave, when used in the albumenised collodion process, more vigorous proofs than those which a new and colourless collodion would have given under the same circumstances. Starting from that, I prepared a collodion in which I substituted for the iodides hitherto placed in them pure iodine, and I prepared with this collodion a dry collodionised paper with the honey and albumen preservative film, following the method already pointed out.

By employing this paper in a humid state, I procured proofs much more striking in their contrasts of the blacks and whites than those I obtained with a pose of equal length with the first paper: and in employing it in a dry state, the proofs which, with the first paper, were wanting

in vigour, were found, after a feeble pose, very fine and harmonious; the whites preserved themselves perfectly during the whole process of developing.

Such is the process which I have employed, with unvarying success, for a year past. I have not been able to find any preservative liquid which gave me better results than the mixture of honey and albumen. The albumen employed alone gives, even with the iodised collodion, only pale proofs, developing themselves with difficulty. I saw that other syrups, less clear, might be substituted for the honey syrup—such as those of sugar and glucose. I have used the latter, which is cheaper.

Other substances may certainly be substituted for the albumen, such as gelatine, caseine, &c. mixed with syrups or otherwise; but it will probably be found that no advantage will arise from their use, which will likewise be less easy than albumen.

(*To be continued.*)

THE MOLECULAR ACTION OF CRYSTALLINE PARTICLES.

BY DR. A. WELLER.

WHEN a piece of glass is covered with a solution containing the double phosphate of ammonia and magnesia, and traces are made upon it by any hard body, it is known that they become visible shortly afterwards by the salt being precipitated upon them. Berzelius, who mentions this test in his Elements of Chemistry, states that Wollaston proposed to make use of this fact as a test of the presence of magnesia in solution, which has since been frequently adopted. According to Berzelius, the cause of this property is of a mechanical nature, probably from the glass being covered with microscopic crystals, the facets of which take a different position on the traces for some reason which is not easily explained. More recently, Professor Liebig has alluded to this subject in his Vegetable Physiology. These effects are referred by him to a state of unstable equilibrium of the various particles which compose the liquid, which is destroyed whenever a dynamical action is created sufficiently powerful to overcome the feeble attractions, or the inertia of the molecules in solution. He ascribes to the same cause the sudden solidification, upon being agitated, of water which has remained liquid when below the freezing point; the precipitation of a mixture of potash and tartaric acid; also the detonation of fulminating powder from the contact of any solid body.

Neither of these eminent observers mentions having submitted these traces to microscopic observation, although that is the only manner to test the hypothesis advanced by Berzelius. On the present occasion, it is my intention to describe some observations I have made, in order to elucidate the influence of molecular action on the precipitation of saline bodies, similar to that observed in the double phosphate; and to show that a similar influence is exerted over bodies in a gaseous state, and in a state of vapour; and afterwards to point out some phenomena hitherto unexplained, such as the fixation of the mercurial vapours in the daguerreotype, for instance, which evidently depends upon a like cause. In order to obtain the double phosphate, I have generally used a solution containing about ten grains of phosphate of soda, with about three of carbonate of ammonia, in an ounce and a half of water. I have preferred this mixture because the ingredients are more easily procured, and are less acted upon by the atmosphere than the phosphate of ammonia. The magnesia solution was generally a few grains of sulphate of magnesia to the same quantity of water as above. A small quantity of the first mixture is poured on a piece of glass, and to this are added a few drops of the magnesia in solution; if it be allowed to remain undisturbed, in a few minutes the surface of the liquid becomes covered with a thin film, and on the glass appear minute shining crystals, but if, before those crystals have time to form, any solid substance, as a glass-rod or an empty pen, for instance, is passed over the glass through the liquid, the course it follows becomes visible shortly afterwards. The images which are thus formed are double, and may be termed the upper and lower images. I will first describe the upper images. They appear on the surface of the liquid itself, when the film would otherwise have been formed. They are seen immediately after the passage of the pen through the liquid, whereas the lower ones only become apparent a few moments after. Being formed on a moveable surface, they are not perfect representations of the traces that have been made, and are changed and distorted by any movement of the liquid. When the solution of salt is weak they frequently disappear in a few moments after their formation, and are re-dissolved in the liquid; when the liquid is more concentrated, they likewise disappear, owing to the formation of the film on the surface. The production of these images appears to be independent of the chemical nature of the body used for tracing. They may be obtained independently of the lower ones, by drawing a thread gently over the surface of the liquid, without its coming in contact with the surface of the glass. The lower images are formed on the surface of the glass, under the upper ones. A few seconds after the tracing has been made upon the glass, they begin to appear, and gradually become more distinct. The space of time which elapses before their appearance depends upon the strength of the solution. When it is strong they appear quickly, and when weak they take several minutes before they are visible. To cause the formation of any images, the tracing must always be made after the mixture of the two solutions; under no other circumstances have I been able to create them. Thus, when the tracing is made on a perfectly dry glass, or on one slightly wet, and then immediately covered with the solution, no image will be created. This is likewise the case when we make traces in either the magnesian or the phosphate solution before their mixture together. The passage of any solid substance in the proper solution, on glass, will cause the formation of a deposit. Wood, glass, slate, and other similar substances, all have equal power in this respect, but metallic substances are less active.

(*To be continued.*)

ON CASEINE FOR PHOTOGRAPHIC PURPOSES.

BY P. C. DUCHOCHOIS.

To prepare soluble caseine, add about 15 drops of pure sulphuric acid (diluted in one ounce of water) to a quart of skimmed milk; let it stand ten or twelve hours. Collect on a filter the precipitate, which is coagulated caseine; wash it three or four times with pure water, and mix it with newly-precipitated carbonate of baryta; the acid will soon be saturated, and the caseine dissolve in water; then filter the solution, and evaporate carefully to the consistence of syrup (or to dryness, if you want to keep it), at a low temperature.

The caseine possesses all the chemical properties of albumen, and is isomeric with it.

As a substitute for albumen, in photographic preparations, I have found the following advantages:—

1. It does not desiccate so completely as albumen; is consequently less liable to scale, or to split, and can support a larger proportion of iodide without fear of crystallisation.

2. It coagulates less strongly, and gives a film less tenacious, and more porous; hence, proofs are more harmonious, and preparations much more sensitive than those of albumen. They are not, however, as rapid as collodion; but, by adding to the caseine some of those substances which give more sensitiveness to albumen (honey or soluble starch), I have obtained a good negative (in operating with the dry film) in 75 seconds, the collodion requiring one minute.

3. It is excessively fluid, easily filtered, and always free from those mucous threads which form in albumen.

It is also a very good varnish for collodion negatives, and can be used to prepare positive paper. Until now I have not been able to coagulate evenly the caseine on glass, having

obtained every time a film full of marbling lines, like those which take place on a collodion film sensitised with a too weak silver bath, or which does not contain enough pyroxyline. I think to overcome soon that difficulty.

By uniting caseine with albumen, I have obtained perfect proofs as harmonious as those on collodion, and in a time of exposure twice more rapid than on albumen.

The formulæ were—

A.

	Solution of caseine, as thick as albumen	3 fluid ounces.
	Albumen (from ducks' eggs)	2 do. do.
Solution of	Pure water	4 drachms.
	Crystallised honey	50 grains.
	Soluble starch	15 do.
	Iodide of ammonium	40 do.
	Bromide of ammonium	10 do.
	Tincture of iodine (new)	5 drops.

B.

Rain water	4 fluid ounces.
Nitrate of silver (crystallised)	125 grains.
Nitrate of zinc (fused)	70 do.
Acetic acid	1½ fluid drhm.

C.

Rain water	1 quart.
Acetic acid	1½ fluid drhm.
Gallic acid	70 grains.
Pyrogallic acid	15 grains.

Solution of nitrate of silver, at 4 per cent., in water, added to the developer in very small quantities when required.

The operations were conducted in the same way as for albumen.

In the collodio-albumen process of M. Taupenot, the above formulæ are the best I ever found for sensitiveness of the preparation, cleanliness and beauty of the proofs, never causing any blistering or rising of the film. The process is therefore a sure one, provided the collodion is not very tenacious and contractible. I do not hesitate to recommend it in preference to any other. The caseine can also be employed *alone* for dry collodion: here, again, it is very superior to albumen, gelatine, or meta-gelatine. The caseine solution must be very fluid, so as to filter easily through paper. The *modus operandi* is absolutely the same as for those processes:—Wash the sensitised collodion film; let drain a few seconds; pour upon it the caseine; let dry; expose; develop.

The preparation of pure dry soluble caseine is not very easy for those not well acquainted with chemical preparations; but I believe it will hereafter be found in any place where photographic chemicals are sold.

PHOTOGRAPHY APPLIED TO MILITARY PURPOSES.

We are indebted to Mr. Spiller, a gentleman whose name must be familiar to all photographers, and whose experimental skill and rare scientific acquirements have acquired for him the honourable post of photographer to the Royal Military Repository, Woolwich, for an opportunity of inspecting a series of photographs illustrative of a part of the course of instruction given to the non-commissioned officers of the Royal Artillery. The photographic album, lately transmitted to the War Office, includes a number of illustrations, in a complete series, of the successive operations gone through in working heavy ordnance; such as the serving of guns, mounting and dismounting, the use of sheers, gyns, and cranes, for raising, lowering, or otherwise disposing of the ponderous masses of iron which constitute the 56 and 68 pounders of the present day. The several processes of embarking and landing guns, and the mode of adapting the tackle for these purposes; together with the construction of the heavy gun raft, represented in four different stages, are clearly shown; these, together with some of the various forms of military bridges, constitute the principal objects which have, during the past summer, been brought within the scope of photography.

Considered as photographs merely, these pictures are of the very highest order, many of them have the advantage of a picturesque back-ground of fine foliage, which, combined with water, has in no small degree contributed to the general effect; while, in a military point of view, it cannot be doubted that much value will be attached to the accuracy of detail; such, for instance, as that shown in plate 84 of the new pattern triangle gyn; which proves that, on account of their fidelity, photographs must eventually supersede even the most carefully-executed drawings. As an aid to instruction at the Royal Military Repository, photography must be regarded as of the highest value; serving, indeed, the same purpose as the diagram to the lecturer.

Critical Notices.

Stereographic Illustrations of Compositive Photography. By J. Elliott.

We have, on several occasions recently, animadverted upon a department of compositive photography, which we thought called for a remonstrance on our part. Since then we have pushed our inquiries further on the subject, and have made it a special point to watch the progress or retrogression which might be perceptible. We have before us an almost complete history of the art in a series of the chief stereoscopic slides which have been published up to the present time. Amongst them we have, what we believe to be, the first of the kind ever issued, and this decidedly is of the class spoken of in our twelfth number as being sentimental, &c. Then follows the series of "My First," "One too Many," "Five weeks after Marriage," "Broken Vows," &c. &c. These are too well known to need more than the mention of their titles, and our opinion of them has long since been recorded in these pages. It is, however, but fair to mention, that those just enumerated are among the very first attempts in this branch, and as such, although they bear sufficient evidence of a want of thorough artistic skill, there is, at the same time, no little credit due to the ingenuity of the composer; this, in fact, we have ever been ready to acknowledge in all our notices. Taking, then, the new subjects which have been more recently published, we can still see traces of the imperfections which are so evident in the earlier productions; while, at the same time, there is a great advance in ingenuity, and a decided improvement in the powers of arrangement. For instance, a new slide of a wedding is much more naturally and yet elaborately grouped; and, instead of a Protestant clergyman, we have a Roman Catholic priest, and, as a matter of course, the elaborate furniture of a Roman Catholic altar, which gives greater facilities to the compositive talent of the arranger. Still it is but a transposition of the original idea; and a wedding is a wedding, whether the ceremony be performed by Catholic priest or Protestant clergyman. "The Orphan's Dream" is well grouped, and the representation of the floating dream is most ingenious; but yet there is scarcely that amount of poetic feeling in the rendering which we should like to see. It is too ambitious an effort, and the subject is one which can scarcely be touched by photography. "Homeless and Friendless," a slide not yet published, is well worked out as far as the placing of the figure goes, but the falling snow has a painful, dazzling effect, and the fallen snow is decidedly woolly. "The Fairy" is, perhaps, a still more ambitious effort than any of the preceding. It is the figure of a female floating in mid air, and behind whom is a background of stars. The pose of the figure is easy and graceful, but the astronomical background is rather out of place. We have puzzled our brains to find out in what exact constellation the brilliant group of stars which adorn this picture is to be found. They have evidently been stuck on by a non-astronomical photographer, while, unfortunately, the *sky* has a series of wrinkles, more suggestive of a stretched sheet than of the fair canopy overhead. Those last mentioned are,

in our opinion, the least successful of the new series; but while we say this, we would acknowledge that there is a decided improvement upon the earlier and more crude attempts in this department, and in them there is hope for still greater success.

"The Reception and Profession of a Sister of Mercy," illustrated in two slides, are interesting, on account of the announcement that they "have been prepared with every regard to correctness of detail"—the artist acknowledging his thanks to those who assisted him in the composition, including "a venerable ecclesiastic, and an archbishop's lay secretary." The arrangement is very effective. The series, including "The Money-lender," "The Inventory," and "The Sacking of the Jew's House," are very decided steps in advance of any that we have yet seen. The manner in which they are respectively treated is very interesting; and, judging from the difficulties which must be overcome—such as the impossibility, we had almost said, of getting so many figures to be steady while the picture is being taken—the ideas are very well carried out. It is the above-mentioned difficulty which so mars the effect of these compositions; for, short as the time may be in which the negative is taken, it is sufficiently long to cause the models to become rigid and expressionless. Hence, in the series entitled "The Sacking of the Jew's House," though the grouping and arrangement are almost faultless, yet there is an apparent want of earnestness of expression on the faces of the principal characters.

These remarks are not made in any hostile spirit. It will be seen from the above, that we mark a gradual and decided progress in this department; and the faults pointed out, are not so much those of the composer as that they are inherent in this branch of photography: and we are glad to see that some of our most eminent photographers take an interest in elevating rather than degrading our favourite art.

EXHIBITION OF THE ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.

The second annual exhibition of this association opened on Friday last—the "private view" being held on the previous evening—the attendance on that occasion was not large, and the show of pictures, both in quantity and quality, was below that of last year. Indeed we cannot see how it could be otherwise, for if the association has merely for its object the illustrations of architecture, and monuments to be found here and there, it must be limited in its scope; and no better proof of this can be given than the present collection. In it there is scarcely a picture which the regular visitor to photographic exhibitions has not seen attempted some time or other.

As yet the association is but an experiment, and it remains to be seen whether repetitions, or even new architectural subjects, are of sufficient interest to the majority of visitors to sustain it in existence.

Macpherson has illustrated Rome in one hundred and twenty views. Cimetta, Venice in thirty-three views. Melhuish, London in two views. Robertson and Beato, Cairo, in thirty-one views. Lousada, Spain in twenty views. Lowndes, Cocke, Frith, Bedford and Cade, in England, and Baldus, Paris, are also contributors with several other minor artists. Among whom our readers will be as much astonished as we were to find the absence of Fenton; this is to be regretted, for there are very few who will not remember with pleasure such choice specimens of architectural photography as his "Galilee Porch, Ely Cathedral," "the West Porch of York Minster," and pictures of that class.

There is something novel in the mode of the arrangement of the collection. There are no glazed pictures; the photographs are mounted on plain cardboard, after which they are nailed to the walls, and then a length of beading is laid along, and every set of four pictures is enclosed when convenient. By this means a great deal of space is saved.

We were much gratified to see that the managers had availed themselves of the hints we threw out in a former number with regard to the pricing of pictures, which gave so much offence last year. The manner in which the pictures are priced this year is by a series of numbers; each picture has a numerical value varying from 6 to 15, and any person who pays his subscription is entitled to as many pictures, of which the total numerical value shall not exceed fifty. This system, it is thought, will obviate much of the difficulty and dissatisfaction felt last year. The mode of placing all the work of each artist together, is one which has many advantages to the visitor, and which has been pointed out with regard to other exhibitions in the "PHOTOGRAPHIC NEWS."

In noticing the pictures, the arrangement enables us to proceed with all the works of one artist; Rome, as we before stated, is illustrated by Macpherson, in one hundred and twenty views. In this number there is more diversity in the negatives, and more inequality in the printing than we ever noticed before in one artist's productions; and not only does this inequality occur in subjects of different classes, such as architecture and landscape, but also in subjects which ought to have been treated alike. There is, besides, on the average, a great want of half-tone in these pictures; the blacks and whites are too intense even when the picture is only moderately printed. In some instances, owing apparently to the inferiority of the lens, there is a violation of all received notions of gravitation, and certainly a great want of that which we are always led to expect in architectural drawings—mathematical precision; while, on the whole, these pictures lack that brilliancy which we have seen in other pictures of this city.

No. 1. "Temple of the Sibyl, Tivoli, seen from the opposite side of the Ravine," is a vigorous picture, in which there is a nice definition of light and shade, with here and there a good deal of detail. The picture of the "Temple of the Sybil seen from the Bridge" (2), is a great contrast to the one just named, there is scarcely any half tone, and an almost entire absence of perspective effect. "The view of the Temple of Pallas" (3), "Temple of Vesta and the Fountain" (5), "Columns of the Forum of Nerva" (9), "Arch of the Goldsmiths" (11), are all printed too darkly, and thus prevent anything like a minuteness of detail. "Easter Benedictions at St. Peter's" (7), has all the characteristics of *instantaneous* photographs of crowds, confusion and indistinctness. "Interior in the Vatican," styled the Philosopher's Hall (8), is as bad an attempt at an interior as we have ever seen. Interiors are at all times difficult subjects, as most photographers know, and therefore they should never be attempted unless the artist has full confidence in his powers. In "The Base of the Column in the Forum of Trajan" (12), we have a striking instance of the violation of the laws of gravitation above alluded to. We are only allowed to see the base of the column, and so we can form no correct opinion as to the degree of inclination of the column. But it strikes us as being several degrees greater than that of the Leaning Tower of Pisa, which is looked upon as one of the wonders of the world. "The Tomb of Cecilia Metella, with a distant view of Rome" (13), is a subject in which there is room for a great display of detail and half tone, but the artist has evidently failed to catch or treat it in accordance with the manner in which we are accustomed to see similar subjects treated. "The Castle and Bridge of St. Angelo, with the Vatican in the distance" (14), is a curious picture, as in it we see combined many of the faults of the whole series, but more especially inequality. The bridge and water, with the distant view of the Vatican, are printed extremely light, while the castle is very dark. "The Statue of Moses" (16), and the "Equestrian Bronze Statue of Marcus Aurelius" (17), have many good points about them, but as specimens of statue copying they are far below what we have seen. "Large view of the Claudian Aqueduct" (19), has many faults; the ruins are given with great distinctness and clearness, while the foreground is black and indistinct, and the back ground is not perceptible. "View over Rome from the Janiculum" (21), is far inferior to Mr. Fox Talbot's photoglyph of a similar view of Paris. "Forum Romanum, general view" (22), is much less brilliant and vigorous than the same subject treated by an exhibitor at the last exhibition of the society. "The Church of San Bernardino, Perugia" (25), "Cathedral of Orvieto" (26), are two of the most successful in the series, more especially the latter, in which we are enabled to trace with the greatest minuteness the whole of the architectural detail, and inspect the beautiful frescoes with which the front of this building is decorated. "A Group from a fresco by Luca Signorelli, at Orvieto" (27), is much inferior to the same subject as treated by Alinari Brothers. "The Garden in the Vatican" (44), is a subject

well calculated for a good picture, as there is great scope for showing to perfection the foliage of the trees, but in this instance they are rendered in black masses, with very little detail. We omit noticing a great number of this series, as it would only be a repetition of the faults and blemishes we have already pointed out. We may just mention that in "The View of the Aqueducts—Aqua Claudia" (87), there is the same degree of uniformity of colour, the same absence of light and shade, the same smudginess and sootiness, which characterise the prints produced by the celebrated carbon process, as practised by Mr. Pouncy. We are at a loss to decide which of the two are the worst. Having thus impartially noticed this series and pointed out the most glaring defects, we would state that we do not speak with any bias on the subject of these productions; the foregoing are our honest convictions of the merits of Mr. Macpherson's pictures.

(To be continued.)

Lessons on Colouring Photographs.

COLOURING POSITIVES ON GLASS—(*continued.*)

Imperfections and Spots.—The first colouring is now completed, and the picture is ready for varnishing. Before doing this, however, it will be necessary to attend to a point which, perhaps, ought to be looked to before commencing to colour—the "touching out" of imperfections and spots. Where these mischievous sprites have baffled the care of the operator, he must rely on the aid of the colorist. When, however, perfect pictures can possibly be obtained, faulty impressions should be, for the credit of photography, unhesitatingly destroyed. But it will sometimes happen that pictures good in themselves, and of which no other copy can be obtained, have a few minor defects which may be remedied by a skilful use of the pencil. For this purpose water colours must generally be used. Black spots in the background or draperies may easily be managed. The colours to be used must to some extent depend on the tone of the photograph; but a little chinese white, naples yellow, and sepia or indian ink, mixed to the proper tint, will generally answer: it must be applied on the point of a sable pencil, taking care to lay on no more than is absolutely required, so as to avoid the appearance of any excrescence of colour on the surface. Spots on the lights, especially on the face, are more difficult to manage; they must be carefully touched with chinese white modified by naples yellow to suit the tone of the picture: this should be tried on a corner of the plate first, to ascertain that the mixture perfectly harmonises in tone with the photograph; if this be the case and it be skilfully applied, taking especial care to use no more than just covers the spot, after the picture is coloured the defect will be scarcely observable. Cases will sometimes occur, especially in portraits of children, where the eyes have moved, or are not perfectly sharp. This may be remedied by the use of water colours. The pupil may be put in with indian ink, and the outline of the iris carefully traced with the same much diluted; the marking of the eyelids and eyelashes may be strengthened with indian ink, and the point of light put in with chinese white. Remember, however, that without some knowledge of drawing, and some little skill in using the pencil, no change should be attempted, as it is very easy by one false touch to alter the likeness and spoil the picture. Remember, also, that the free use of water colours will produce a coarse effect, from its want of harmony with the texture and surface of the glass picture; that their use is only permissible to remedy defects, and should be regarded as a *dernier ressort.*

Varnishing.—All defects remedied and the first colouring completed, the picture is ready for varnishing. The use of a suitable varnish is of importance both as regards its influence on the appearance of the finished picture, and the surface it presents for the second colouring. A common error in the manufacture of varnishes for photographs, especially for positives, is giving them too much body. Something more than the means of spreading an even layer of gum over the surface of the picture is required, whilst that is all that many of the varnishes seem intended to effect. This will certainly sometimes serve as a protection to the photograph, but at the same time it imparts a glazed, vulgar effect to the picture, and renders the subsequent colouring difficult and comparatively ineffective. A varnish which affords facilities for producing the most artistic results in the finished picture, should give depth and transparency to the shadows, without appreciably glazing or lowering the whites, which it should leave with a surface somewhat "flat" or dead. By this means the greatest depth and vigour of which the picture is capable is secured, together with a "biting" surface for the second colouring, on which any amount of brilliancy may be obtained.

We offer no recipes or suggestions for the manufacture of varnish, as we think that, generally, the attempt on the part of the photographer to make his own varnishes is a great mistake. Much more judgment and experience in the selection of gums and resins, and their solvents, than is likely to be obtained in the practice of most photographers, is requisite to ensure success in varnish making. Most amateur attempts result in the production of an article which, by cracking, blooming, or turning yellow, is likely eventually to spoil many good pictures, and at a price often exceeding that at which a good varnish may be purchased.

A varnish with a benzine or chloroform solvent generally gives the best surface for the second colouring; a spirit varnish, unless manufactured expressly for positives, in most cases yields a surface too hard and glassy. Spirit varnishes always require heat in the application, or they dry dull and opaque. Benzine varnishes dry bright and transparent without heat, but are better for its judicious application in damp or cold weather. Chloroform varnishes generally dry rapidly without any heat. A little care is required in the application of all varnishes, the same as in coating a plate with collodion, to secure an even film, free from waves and unequal patches, and to prevent a return wave at the bottom of a plate. This will be gained very easily by practice, and observing the instructions usually given by the makers on the label of each bottle.

Experience and observation will enable the colorist to determine beforehand the modification of each colour, as applied in the first colouring, which the varnishing will produce. As a rule, reds, yellows, and greens are the least affected, whilst dark browns, some blues, violets, &c., are almost destroyed by it, and are best therefore left until the second colouring.

(To be continued.)

Photographic Chemistry.

ORGANIC CHEMISTRY—(*continued*).

EXPERIENCE teaches us that oxygen may unite, either with carbon to form carbonic acid, or with hydrogen to form water. Now, as we have already stated, organic bodies being for the most part formed of carbon, hydrogen, oxygen, and nitrogen, it is by no means strange that certain of these bodies are modified, and, in some cases, wholly destroyed, by exposure to atmospheric air.

Fermentation—a term employed by chemists to indicate the spontaneous decomposition which animal or vegetable substances undergo under certain circumstances—is also one of the causes of modification or destruction of organic matters. Different organic substances that are eminently decomposable, and are employed to provoke fermentation in other bodies, are known as *ferments;* as, for instance, in the case of beer, a little yeast causes fermentation in the whole mass; or if the juice of grapes be exposed to a gentle heat, it begins to effervesce—it loses its transparency; a viscid scum rises to the surface; the taste is changed—it has now a *vinous* taste, and may, if properly managed, be converted into wine. During the process of fermentation the sugar

has lost a part of its carbon, which has been liberated in the form of carbonic acid, and the result has been the formation of alcohol. This liquor, having undergone the vinous fermentation, may be exposed to a sustained temperature of about 75°, when another change takes place. It loses its transparency, and acquires a muddy appearance. Its taste is also altered—it has become sour; the alcohol has changed into vinegar. This is called the *acetous fermentation*. By long keeping, this vinegar undergoes another metamorphosis. It loses both its acidity and transparency; it gives off a putrid smell; and has reached its final stage—*putrefactive fermentation*. It is to a species of fermentation of gall-nuts crushed in water that photographers are indebted for gallic acid—the tannic acid originally contained in them being converted into gallic acid. There is another way of preparing this acid, but we will not refer to that at present.

Contact with the air and fermentation are not the only means of decomposing organic substances. Chemists accomplish this in various ways; sometimes merely separating one substance from the other, or otherwise reducing it to its *elements*. Chemists are not merely destructive, however; by their knowledge they are able, with the aid of the elements, to reproduce many of the substances we find in animals or vegetables.

Organic bodies may be classed in three categories—acids, bases, or indifferent bodies.

Organic acids, whether natural or artificial, are very numerous. Hitherto, but few of these have been employed in photography. Among these may be included acetic acid, citric acid, gallic acid, pyrogallic acid, and tartaric acid. Very many of these bodies possess the property of reddening litmus, and they all combine with bases to form salts, just as the mineral acids do, from which they differ in being more complex in their composition.

The organic bases have also been termed *organic alkalies* or *alkaloids*; all of them resemble ammonia in their properties and their mode of combination. These bodies can unite with acids to form salts. As a rule they are not very soluble in water; some of them, however, communicate an exceedingly bitter taste to water. They are for the most part solid, and are capable of crystallising; a few of them only are liquid. Most of them are medicines, and some of them are very powerful poisons. We may enumerate, among others, morphine and narcotine, which are the alkalies of opium; nicotine, the liquid alkali of tobacco; strychnine and brucine, alkalies of the nux vomica, &c.

Among the indifferent bodies there are many which are employed in photography; and, foremost among them we may quote pyroxyline, cellulose (paper), gum, sugars, alcohol, ether, albumen, gelatine, and wax.

(To be continued.)

Dictionary of Photography.

Adhesion, Attraction of, (*continued*). — The use of the numerous cements employed by photographers to mount photographs and build up glass dishes and baths, depends upon the attraction of adhesion; and a little reflection on the very varying degrees of force which is exerted by the same cement between different bodies will show how this attraction varies with the substances exerting it. Gum or paste, which will cement paper, will not answer for glass, as this requires some resinous body. It must be remembered that a cement should always be used thin, as its readier adaptation to the varying changes of temperature prevents that destruction of the cohesion of its own particles which would gradually take place were the cement to be used thick. Sometimes the force of adhesion between the cement and the body which it unites is greater than the actual cohesion of the particles one with another of that body. Thus pieces of wood which have been glued together and then torn asunder will frequently not separate at the layer of glue, but at a fracture in the wood itself. Paper photographs may be easily split into two laminæ by cementing a piece of linen fabric firmly on to each side, and when quite dry separating them. The cohesion of the particles of the paper one with another being less than the adhesion of the cement to the paper, the latter separates into two films, which, by dissolving the cement which holds them to the linen, may be washed, dried, and ironed.

Affinity.—The various bodies which surround us are all formed of an inconsiderable number of simple substances or *elements* united one with the other in different proportions by certain forces, to which has been given the name of *affinities*.

These *affinities* are of two sorts. One, by virtue of which the molecules of bodies adhere together, is known under the name of the *affinity of aggregation*, or attraction of cohesion, which we have recently described. The various degrees of this affinity govern the differences which are apparent in the resistance of bodies to external force. When it is considerable, the substances are hard and solid; when inconsiderable they are liquid; and when this force is still more diminished, they become gaseous. These three states of bodies—the solid, liquid, and gaseous—are called *forms of aggregation*. On this affinity of aggregation depend also the regular forms which are assumed by certain bodies when they pass from the liquid to the solid state; this is known in chemistry by the term *crystallisation*. Hardness, softness, toughness, brittleness, &c., are equally modifications of this form. Its powers may be mechanically overcome by pulverisation or similar operations, and chemically by the action of heat.

The other kind of affinity is known under the name of *affinity of composition*, or *chemical affinity*.

It is only exercised in compound substances, between the simple bodies of which they are composed. By its means two bodies are enabled to unite, and give rise to a third new substance, which frequently does not possess a single inherent quality of the substances of which it was compounded. Thus chlorine and silver are enabled, by means of their chemical affinity, to unite and form the white powder, chloride of silver.

For this reason, it is customary, in describing the two kinds of affinity, to call the first—that of aggregation—a force exerted between homogeneous substances; for example, between the separate molecules of chloride of silver: whilst the second—chemical affinity—is exerted between heterogeneous substances; for instance, between chlorine and silver.

Chemical affinity is modified in several ways, of which the following are the principal:—

1. It is never exerted in an equal degree between all bodies, but always with a force greater in one than in the other. Thus, zinc has a greater affinity for chlorine than silver has; so that, if a piece of zinc be mixed with moist chloride of silver, the chlorine will leave the silver and go to the zinc—for which it has a greater affinity—forming chloride of zinc, and leaving the silver in the metallic state. This modification of chemical affinity is known by the name of *elective affinity*, because a substance seems always to choose, from those with which it is placed in contact, the one for which it has the most liking or affinity.

(To be continued.)

A Catechism of Photography.

THE ENGLISH WET PAPER PROCESS—(*continued*).

Q. How is the photographic image taken by this process developed?

A. About a third of solution No. 2 (aceto-nitrate), and two-thirds of solution No. 3 (gallic acid) are combined, and in this combination the proof is immersed. From ten minutes to a quarter of an hour is the ordinary time for developing a picture, but this of course depends on circum-

stances, and the operator must be guided by his own judgment as to the time at which his picture is fully developed.

Q. How is the process of fixing conducted?

A. By the application of the solution No. 4 (hyposulphite of soda).

Q. Explain the philosophy of this process?

A. Upon a sheet of paper is spread a concentrated solution of iodide of potassium and iodide of silver. The paper, having been saturated with the liquid, is dried. It is then plunged into a basin of water, and the double iodide is decomposed, the iodide of potassium being dissolved, and the iodide of silver liberated, so that it rests on the surface of the paper, and gives to it a pale yellow tint, the result of the excessively minute molecules which unquestionably contribute to the perfection of the picture. The paper must remain for some time in the water, in order to insure the equalisation of the desired effect. A considerable quantity of water is also necessary; and, finally, the water must be changed frequently, as the pictures would otherwise be more or less affected by the particles of the iodide which would remain in the bath from previous manipulations. When the paper is removed from the bath one of its surfaces is coated with iodide of silver, and *it is not sensitive.* If over this coating of iodide of silver there is spread a weak solution of nitrate of silver, *the surface becomes sensitive* and is ready to receive the impression of light. The degree of sensitiveness varies according to the proportion of the nitrate of silver, which is easily regulated at will.

OTHER PROCESSES ON PAPER.

Q. Are not photographic papers frequently used wet from the bath without being previously dried?

A. In the wet paper process, the paper is submitted to the action of light immediately after being taken from the aceto-nitrate bath, without being either washed or dried. A piece of white paper, well soaked in water, is spread upon the glass fitted to the frame of the camera; upon this the prepared sheet is placed, the sensitive side upwards. The paper, which is placed beneath, must be free from spots of iron or other impurities. It is also necessary to mark the side of the glass which ought to be at the bottom of the camera, and to keep it always inclined in that direction when the papers are applied: if this precaution is neglected, the liquid collected at the bottom, in falling over the prepared paper, would not fail to produce spots. The paper thus applied to the glass will remain there for an hour without falling off, and can be placed within that time in the camera. The results of this process, however, are not, in most cases, so good as by the dry process.

Q. How are pictures, so taken, developed?

A. By gallic acid. They are fixed in the usual way with hyposulphite of soda.

Q. How may increased rapidity of action be attained?

A. M. Humbert de Molard gives the following plan:—First bath—

Distilled water	500	centimètre cubes.
Iodide of ammonium	20	grammes.

After drying, the paper is floated on the second bath, composed of

Water	250	centimètre cubes.
Nitrate of silver	16	grammes.*
„ zinc	8	grammes.
Acetic acid	8	grains.

Papers so prepared are exceedingly rapid in action. For views, an exposure of one or two seconds is amply sufficient in the sunlight, and five or six in the shade; for portraits, from fifteen seconds to one minute. The picture is developed by passing over the surface a solution of gallic acid, with a few drops of a saturated solution of acetate of ammonia. The picture must afterwards be thoroughly washed in clean water, and fixed by the ordinary process.

* 15½ grains English.

DRY ALBUMEN PROCESS.

Q. Is the albumen process at all employed by photographers upon paper?

A. It is. The process consists in replacing, by albumen or white of egg, the liquid in which is dissolved the iodide and bromide of potassium. The albumen is coagulated on the paper by a bath of aceto-nitrate of silver, which renders the surface sensitive to the action of light. It forms a very fine surface on which to take impressions—possessing peculiar sharpness of outline and delicacy of detail. Sometimes waxed paper is used; sometimes ordinary paper. Some photographers immerse the paper in the albumen bath, so as to cover both sides; others, on the contrary, only float it on the top of the bath, by which means one side only is coated. There are many variations in the methods adopted, some less difficult than others, but all being in the main principles the same.

Q. Detail the ordinary process?

A. The albumen is prepared in the following proportions:—To the whites of eight eggs add 15 grains of iodide of potassium and 3 grains of bromide of potassium. Each egg must be broken separately into a shallow cup, and the yolk retained in the shell as well as the germ; then poured into a measure, until the required quantity of albumen is obtained. Before adding the iodide of bromine, the germ of the eggs must be carefully removed; they must then be shaken up in a wide-mouth, rather large bottle, until the bottle is filled with white foam; it must then stand eight or twelve hours in a cool place; the clear albumen can then be poured off into a basin or plate; and after having laid a piece of paper on the surface in order to remove any air bubbles, the paper to be prepared—either waxed or otherwise may be applied; after contact for about five minutes, the paper may be withdrawn by a slow, regular movement, and hung up to dry. The albumenised side of the paper may afterwards be applied to the aceto-nitrate bath.

Q. How is this bath prepared?

A. The aceto-nitrate bath is a solution of nitrate of silver and crystallised acetic acid.

Q. When the paper is prepared in the aceto-nitrate bath, is it ready for use?

A. After receiving the sensitive coating in the aceto-nitrate bath, the prepared paper is washed in pure water, dried—as in other processes—and reserved for use. The whole of the subsequent operations are identical with those which have already been described.

(To be continued.)

Correspondence.

THE PHOTOGEN.

Dear Sir,—The information you ask for in your Notices to Correspondents, p. 180, with reference to this light is best afforded by a few extracts from the printed specification of the patent, which I happen to have by me.

The invention is described as being for "Improved Apparatus to be used for Burning Pyrotechnic Compositions or Preparations for producing Artificial Lights of various colours;" and the specification states as follows:—

"My invention of improved apparatus to be used for burning pyrotechnic compositions or preparations, relates to a means of burning any of the chemical compounds that are usually employed for producing various coloured lights such as are required for theatrical performances, some of which chemical compounds will, however, produce lights of such a quality as will admit of their being used for photographic purposes. The ordinary mode of burning these compounds for theatrical or other purposes is, to place them in an open vessel in which, when ignited, they are allowed

to burn until consumed. While burning, the composition will give out a brilliant light, the colour thereof depending upon the particular composition that is employed. During this combustion a pungent and suffocating vapour or gas is evolved, which, when the composition is burned in close buildings, is very annoying and disagreeable.

"The object of my invention is to burn these compositions, and obtain the light therefrom, in such a manner as to prevent the noxious vapours or gases from annoying persons in the immediate neighbourhood of the apparatus."

Then after detailing at length how he effects his object—by burning the composition in a vessel surrounded by glass, with a current of air passing through to carry off the gas, the inventor claims as follows:—

"In conclusion I claim, as the invention secured to me by letters patent as aforesaid, the application to the purposes above mentioned of apparatus such as that hereinbefore described, and shown in the drawing, *or any mere modification thereof*, in which pyrotechnic compositions may be burned to produce various coloured lights, and the gases or vapours evolved therefrom carried off, so as not to annoy bystanders."

The Queen's Printers' copy of the specification is published at the Great Seal Patent Office, 25, Southampton Buildings, Holborn.

You will collect from this that the patent only extends to the lantern.

Pentonville. THOS. W. B. COOK.

ENLARGED PICTURES FROM SMALL NEGATIVES.

DEAR SIR,—For taking enlarged collodion positives from small negatives, I use the same large double-bodied camera as for taking the microscopic objects. It should have several false fronts to slide into the grooves, with a piece cut out exactly in the centre, to suit different sized negatives. This piece should be cut out rather smaller than the negative, and a piece of thick card-board, having the portion cut out exactly the size of the negative, and with a margin about an inch wide, should be glued on to it, so as to form a bed for the negative; to this a piece of card-board, with the opening again rather smaller than the negative, should be hinged at the upper part by a piece of sheet India rubber, so as to fall down over the negative and keep it in its place, it may be fastened down with a sharp nail. The dark slide should have a nest of frames, fitting one within the other, to suit different sized plates. The focussing glass should have the size of each plate marked on it in pencil, and measured from a common centre. The double combination of lenses, with half inch stop, should be screwed into the inner camera with the back lens towards the negative to be copied. The negative must be placed with the collodion side towards it. The inner camera must then be placed in such a position between the negative and focussing glass that when the latter is drawn out to give the desired size, the image must be perfectly *sharp* and *clear*. The negative must, of course, be turned towards the strongest light, *but not towards the sun*, if shining. I have never found it necessary to use a mirror to concentrate the light on the negative. The collodion, the bath, and the developer are the same as I use for the magnified microscopic objects. When the prepared plate is placed in the frame, a piece of flannel or double blotting-paper should be placed on the back of it, and the springs of the back shutter will keep the plate in its place. The first result will, of course, be an enlarged positive, viewed by transmitted light; from this a negative may be taken on collodion in the camera any size required, or a negative may be printed from it on paper, which may be waxed. The time of exposure must depend upon the strength of the light, and the character of the negative to be copied—as regards sharpness, I have never found any loss of it if care be taken in the focussing. On the contrary, up to a certain size, I have found greater sharpness in the enlarged positive, the details being much more evident. By this process, transparent positives for the stereoscope may be taken of any required size, from the original negative. Microscopic positives may also be obtained by it, by increasing the distance between the negative and the lenses, and using a stop of small diameter. In this case, sunlight passing through the negative is desirable. When an enlarged negative on collodion is desired, and the positive is not wanted to be kept, it is better to take a positive a very little larger than the original negative, and enlarge from that, as it saves collodion, &c. An enlarged negative may readily be taken off the glass and mounted on thin paper, which may be afterwards waxed, but the negative must be mounted with the same side to the paper as it was to the glass.

Reigate. THOMAS BARRETT.

Photographic Societies.

MACCLESFIELD PHOTOGRAPHIC SOCIETY.

THE members of this society have continued to meet during the season—and on several occasions very interesting papers have been read. A numerously attended special meeting was held on the 14th instant, for the transaction of business connected with the practical working of the society, at which, after hearing the statements of the secretary and the treasurer with regard to its present position and prospects, some minor changes in its arrangements were agreed to; and a committee was named to carry out an object towards which some steps appear to have been taken already: viz.—the organization of an exhibition of photographs, &c., under the auspices of the society, in connection with the annual exhibition about to take place at the Government School of Design. Pictures for the exhibition will have to be forwarded to F. M. Mercer, Esq., the secretary, before the end of the year, and the exhibition itself will open during the first week of January.

FRENCH PHOTOGRAPHIC SOCIETY.

AT the last meeting of the society Count Olympe Aguado presented a numerous series of stereoscopic proofs of large dimensions. Some of these proofs were due to Viscount Onesyme Aguado, and these were of the greatest originality. The subjects were taken from a bird's eye point of view. It was impossible to appreciate them with the naked eye; but viewed in M. Quinet's large stereoscope they presented surprising effects of foreshortening and a striking clearness. Thus one of these proofs, which to the naked eye appeared as a confused mass, showed in the stereoscope a seated individual, whose figure was brought out perfectly in all its details.

M. l'Abbe Moigno also presented a series of small pictures which were forwarded to him by Mr. Fox Talbot, and obtained by this distinguished experimentalist by means of his latest process.

M. Lemercier presented some pictures obtained by photo-lithographic processes, which left nothing to be desired, especially if, as M. Lemercier affirmed, they were really exempt from all retouching.

M. Lemercier further declared that no photographic pictures could approach the low price of those he presented, which cost only 35 centimes the sheet.

M. Charles Chevalier presented a travelling camera which appeared well made, although very complicated. Owing to the numerous changes made in constructing it the inventor was not able to name the cost, but thought it would range between 300 and 350 francs.

M. Humbert de Molard described a new toning bath which gave a very pretty tone to pictures.

M. Selmer, a distinguished chemist, presented a rich and picturesque collection of Swedish and Norwegian costumes.

M. Auguste Leborgne asked permission to present proofs and to make before the meeting a photographic experiment *à la lampe;* but so many novelties were inscribed on the paper, that he was asked to defer his experiment until the next sitting.

Some interest was felt in M. Leborgne's proposed experiment, in consequence of his using a product of his own discovery in lieu of the nitrate of silver. This product he terms oxy-ethylate,

and a good deal of incredulity is expressed as to its capabilities; several who pretend to know the composition of this new substance assert that it is nothing but his old silver solution. —*Condensed from the "Revue Photographique."*

Miscellaneous.

On the Preservation of Photographs.—Complaints of the fading of silver prints are so common, that, though it may not in many cases be possible to prevent this catastrophe, we will point out a few precautions, by following which it may at least be delayed to the latest moment, if not postponed indefinitely. One of the causes of fading, and that which is most generally assumed to be *the* cause, is imperfect washing; but there are other causes which can be more easily guarded against, and these are, exposure to damp, sulphuretted hydrogen, sulphurous vapours, combustion of gas, and laboratory effluvia generally. To preserve silver prints in good condition, a portfolio is absolutely essential; and whenever the prints are taken out for the purpose of inspection they should invariably be restored to their proper place when this is completed, and the portfolio carefully closed. The last-named article is one of considerable importance, if it be desired to preserve the pictures in the same state of purity as when they were first placed therein. Unfortunately there are few which are as perfect as they might be; they are usually open at the sides, so that dust, and to a certain extent light, can creep in; moreover, the edges of the pictures fall below the level of the solid sides when the portfolio is held upright, and consequently, when it is dropped beside the book-case on the table, or when it is placed on the table for the purpose of opening it to add to its contents, or otherwise, the edges of the pictures are brought under considerable pressure, and are gradually damaged, and rendered unsightly. The best portfolio we have met with was one which is described in our advertising columns under the well-deserved name of the only perfect portfolio. It is so contrived that, no matter in what position it may be placed, the edge of the picture cannot come in contact with anything except the leather on which it rests, which is suspended, as it were, between the two sides. It has also another recommendation, the surfaces of the pictures are not subjected to unequal pressure in different parts; indeed, unless the portfolio be over-filled, there is no pressure of any importance on any part of them: besides this, one of the covers is furnished with leather flaps, which lap over the three open sides and are retained in their places by elastic, to the ends of which are attached a kind of hook that fits into a lock, and which lock is closed by simple pressure, though a key is necessary to open it, and the portfolio may then be said to be hermetically closed against light and dust. It has other advantages, but it is not necessary that we should enumerate them, as they bear merely on the question of convenience, and do not affect the subject on which we have based the preceding remarks, viz. the careful preservation of photographs.

Photographic Notes and Queries.

SUBSTITUTE FOR A DARK TENT.—STREAKS ON COLLODION PICTURES.

Sir,—As some of your correspondents want a cheap dark tent, I will give you a description of a simple one of my own construction, which I have been using for some time. It consists of a box about 18 inches long, 16 inches broad, and 10 or 12 inches deep. A hole is to be cut in the bottom about 6 inches square; this, being glazed, is to serve as a window, which must be covered with a yellow blind. Next procure about 2½ or 3 yards of black calico, and sew the ends together; this will form a kind of bag, which is to be lined inside with yellow calico. One end of this bag is then to be nailed round the edges of the box, and *plaited* so as to leave it *full*, and the other end furnished with a "running string." Into this end the operator is to thrust his head and shoulders; and then, having his hands inside, he is to draw the string round his waist *tightly*, so as to shut out all light except that which enters by the window, or penetrates the calico. After tying the string, the operator finds himself in a *chemically* dark room, where he may go on with his work very conveniently. It will be well to blacken the inside of the box, so as to prevent any light finding its way into it through any chink or crevice. When I am taking portraits of families at their residences, I set the box on one of its ends on a table near a window, or other convenient place, where there may be a sufficiency of light. In taking views, it is easy to find some bank of earth or a low wall near the scene of operation, for the purpose of resting it on instead of a table.

With regard to the muddy streaks on the negative which some of your correspondents complain of, I think they are caused by allowing the nitrate of silver solution to flow over the plate in *streaks* after draining it into the bath before exposure. If the plate be *thoroughly* drained into the bath, one corner of it being allowed to touch the dipper, so as to take off the drop that seems to linger on that corner, and the plate be placed immediately in the dark slide, keeping it in a vertical position so as not to allow any drop of the bath to find its way across the film, those streaky stains may be prevented. Hoping this will find a place in your valuable periodical, I am, &c., A. Horan.

ILLUMINATED PAPER STEREOGRAMS.

Sir,—Noticing in your last number a query as to the best mode of procuring "Illuminated Paper Stereograms," I would suggest the following method as being at once easy and successful:—Print as usual on *thin* albumenised paper; then take a piece of thin, foreign negative paper of the same size, and fasten it slightly at the corners to the face of the print. Hold it against a window, and trace on the paper the outline of the object. Then separate the papers, and paint the *paper* a dark blue for the sky, filling in the other parts with the proper colours, then colour the back of the print in the same manner with rather paler colours, and when dry fasten the papers (painted side inwards) together. If a moon is required, cut through the double paper, and put a piece of thin gelatine at the back; if clouds are wished for, colour the sky with some dark colour, and the side towards the light must be touched with white wax, or light clouds may be waxed only. The method I adopt is to hold the *paper* over a lamp, and just touch it in the places where I want the clouds with the wax. Of course I only wax the *paper* so that it does not spoil the print, and it must be done before they are fastened together. For an illumination the coloured lamps must be pricked with a fine needle, and strips of gelatine placed behind. For a room, or like subject, I only paint the back of the print, and place a piece of thin paper behind to hide the colour. For a fire, I cut with a penknife through the picture, and put gelatine behind. C. H. P.

VARNISH FOR GLASS POSITIVES.

Formula:—"Bitume de Judé," dissolved in chloro-benzine" to the requisite thickness.

Sir,—Having seen an article, about a fortnight ago, in the "Photographic News," of this formula being requisite, I have much pleasure in sending you the above receipt as one I have always found to be economical and durable; it does not in the least attack the whites, and brings out a picture requiring vigour.

In mounting, care must be taken not to employ glue or flour paste, as they have the property of tearing off both varnish and collodion, which adhere to the substances behind them in broken fragments.

When the "chloro-benzine" cannot be procured, varnish with a weak solution of gum arabic, in which dissolve a small piece of sugar candy, to prevent it from cracking. When dry, any sort of black may be used without, in the least, altering the colour of the picture.—Yours truly,

Cherbourg, 7th Dec., 1858. X.

VARNISH FOR PAPER STEREOGRAMS.

SIR,—Will you or any of your correspondents be so kind as to tell me—

1st.—*How*, and with *what*, to glaze a stereoscopic slide, *after* it has been coloured?

2nd.—What are the *best* colours to use—liquid or cake?

3rd.—What is the *best* liquid to grind cake colours in?

I have tried the "varnish for paper stereograms," at p. 95, vol. i., and find that, however lightly the gelatine is laid on, it re-dissolves the colours, and they spread or run over the whole print. Gum water does the same: and as to the gum dama, dissolved in coal naphtha, it will not do at any price; when it is laid on the print, it immediately darkens, the whites become a smoky, dirty colour, and the paper appears as if it had been brushed over with oil—it is semi-transparent. What I want to do is, simply to be able to varnish a coloured print, without disturbing the colours.

H. H. J.

CARDBOARD DISHES.

SIR,—I have for some time past thought of substituting baths, trays, dishes, well-baths, &c., of cardboard, coated inside with gutta percha, for the earthenware and glass ones now used. The gutta percha could be applied as a solution, in benzole, chloroform, &c. The only thing, perhaps, to recommend this plan, is the cheapness and facility with which they can be made. No doubt it would be very useful in preparing papers for the negative and positive processes. If you think this is likely to be of use to any of your numerous correspondents, please insert it in your valuable journal. J. C. S.

DRYING GLASS POSITIVES.

SIR,—I have a slight hint to give to the practical as well as amateur photographer on the subject of positive collodion pictures. I dry my portraits after they are taken on a small tin saucepan containing a little water, and kept over a stove boiling. Place the portrait with the collodion side up, and it will dry instantly; by this means not only is the painter allowed to use his colours with greater ease, but it also sets the collodion so firm on the glass, that there is no danger of rubbing; and if you pass your hand over it, you will not in the least deface the likeness.—Yours obediently,

Chippenham. A FOREIGNER.

ORMOLU FOR COLOURING GOLD FRAMES—FORMULA WANTED.

SIR,—Could you, or any of your correspondents, give me a good recipe for making a nice *flat* and dark ormolu for colouring gold frames? By doing so, you would confer a great favour. A GILDER.

FIELD ROLL FOR TOURISTS—SYNOPSES OF PROCESSES.

SIR,—As you were pleased to approve of my suggestion of "What to Avoid," I am induced to submit for your consideration another idea which I have found useful in each process as I have severally begun them. I found that if I read and re-read one description of a new process until I thought myself up to making a trial, yet, though I knew what was to be done, sometimes I forgot the exact order of the steps, and, in searching it out from a long description, maybe the plate or paper was getting spoiled through having to wait. I therefore prepared and stuck up in my operating room a synopsis of each process, which aided me at once. If, then, you think the publishing these would be of any use to beginners, they are at your service. I therefore enclose some copies for your inspection.

I also enclose my field roll, as I call it, which I read over just before I start, and thereby avoid the annoyance of leaving anything behind. H. S. I.

FIELD ROLL FOR TOURISTS.

When you take the field near home, remember to carry,

For dry plates or paper—

Camera, lens, and stops.
Stand and screw.
Focussing cloth, and glass.
Slide, and frames.
Plate box and plates, or portfolio.
Yellow bag.

For wet collodion in addition—

Bath, cover, and dipper.
Developing glasses.
Water cistern.
Cleaning cloths, and chamois.
Holders, pneumatic and cleansing.
Levelling stand.
Level.
Waste dish.
Solutions,—bath, cleansing, collodion, developing, and fixing.
Tent or other contrivance, and its accompaniments.

H. S. I.

SYNOPSES OF PHOTOGRAPHIC PROCESSES.—WET COLLODION FOR NEGATIVES.

Clean plates.
Coat with collodion.
When set (10″ to 20″) immerse in bath, in 30″ lift out and in two or three times, when ready (1′ to 5′), move out and in till greasiness is gone, and drain off bath as much as possible.
Place in dark slide.
Expose.
Develop; keeping solution in motion.
Wash.
Fix; complete when yellow iodide is gone.
Wash well.
Dry.
Varnish.

Plate cleaning solution, vide "PHOTOGRAPHIC NEWS," vol. i. p. 156.

Developing solution:—

Pyrogallic	1	grain.
Glacial acetic	7	minims.
Alcohol	7	"
Water	1	ounce.

Use more pyrogallic and less acetic in cold.

Fixing solution:—

Hyposulphate of soda	½	ounce.
Water	1	"

H. S. I.

WHAT TO AVOID IN PHOTOGRAPHY.

Do not allow many hours to elapse between printing a positive and fixing it.

Do not allow any unexpected phenomena in photography to pass unrecorded.

Do not attempt to take a picture until you are quite certain that no failure can arise from the use of imperfectly cleaned materials.

Do not attach too much importance to exact formulæ.

Do not allow the sun to shine on the lens when taking a picture.

Do not put away pyroxyline in a damp state.

Do not keep positives in a damp place.

Do not imagine that a new process must necessarily be better than an old one.

Do not use alcoholic solutions in cemented glass dishes.

Do not open an ammonia bottle in the operating room.

ANSWERS TO MINOR QUERIES.

VARNISHING DAGUERREOTYPES.—*F. X. Z.* We do not like the application of any varnish to the surface of these delicate pictures. In 1839, Daguerre wrote:—"The author made attempts to preserve his sketches by means of different varnishes obtained from amber, copal, india-rubber, wax, and various resins; but he has observed that, by the application of any varnish whatsoever, the lights were considerably weakened, and, at the same time, the deeper tones were hidden. To this disadvantage was added the still greater injury from the decomposition of the mercury by the varnishes tried." Now that Fizeau's plan of fixing the image with gold is so universally adopted, the varnish may not perhaps be quite so injurious, but still all the varnished daguerreotypes which we have seen have had their artistic beauty impaired by the operation. Some years ago varnished daguerreotypes were introduced under the name of enamelled daguerreotypes; they were, however, not so pleasing to our taste as the ordinary picture on silver plate.

REVIVAL OF FADED POSITIVES.—*C. A. A.* No method is known by which faded positives can be restored to quite their pristine vigour. We have sometimes used a plan, first recommended, we believe, by MM. Davanne and Girard, which consists in immersing the faded positives in a dilute solution of chloride of gold for some hours, and then exposing to the light. Afterwards pass through hyposulphite of soda, one ounce to a pint, and wash well.

BROMIDE OF CALCIUM.—*Albumen.* Bromide of calcium has been used as an addition to the iodide of potassium, both in the collodion and collodio-albumen processes. It may be prepared as follows:—Take 10 ounces of water and 390 grains of pure bromide, and mix them together, then add gradually 160 grains of clean iron filings, stirring well with a glass rod. As soon as the solution becomes light green in colour, add 200 grains of pure quicklime, which has been previously soaked by pouring water over it. Mix the lime well with it, and allow it to stand together for an hour, stirring occasionally; then pour on a filter, and wash the residue once or twice with distilled water. Collect all the clear liquids together, and evaporate to dryness in a porcelain dish. The residue, which will be bromide of calcium, must be carefully preserved in a well stoppered dry bottle, as it is extremely deliquescent. We have given the above method of preparing this salt, but unless our correspondent is tolerably *au fait* at chemical manipulations, he will find it far preferable to purchase it ready made.

TO PROTECT A COLLODION NEGATIVE FROM SCRATCHING.—*A. Tyro.* We have found the following a very good plan for packing up glass negatives. Take a sheet of fine smooth paper an inch each way larger than the glass, place it on a perfectly flat table (on several sheets of blotting paper), and lay the negative face downwards on to it. Now fold the edges of the paper over the back and paste them down, taking care to have the paper stretched tightly over the face of the negative. The picture will now be secured against scratches, and the glass may be packed up in any desirable manner so as to guard against breakage.

WAXED PAPER.—*P. Q. Raymond.* We have latterly been trying to remove the granular appearance which this paper sometimes has, by soaking the plain paper (English make), before waxing, in a mixture of one part strong hydrochloric acid and six of water. After remaining in this bath for an hour, remove it and wash several times in clean water, then dry and wax as usual; this, besides freeing the paper from spots, renders it beautifully transparent and quite free from granulation, but is very tedious and rather difficult to perform on account of the rottenness of the paper and the washing required to remove the acid from it. Where a little extra trouble is not minded to ensure good results, we can recommend this mode of proceeding.

TO CORRESPONDENTS.

*** *Our next number will contain a full description of the Editor's new method of printing photographs direct on to wood blocks for engraving purposes.*

T. N. S.—Pour a saturated solution of hyposulphite of soda on the glass plate; allow it to remain until all the yellow iodide of silver has disappeared; pour the solution back again into the bottle, and then wash by pouring several quarts of water over it, allowing some to remain on the plate for ten minutes, and then pouring more water over the plate.

W. S. B.—It will be impossible for you to make a small quantity of protosulphate of iron as pure as you can purchase it, and at as low a price. You will succeed best with dilute sulphuric acid and sulphide of iron.

R. P.—We hope, in a few numbers, to be able to give some information respecting the stoves.

A. H. W.—Received.

P. Q. (Seven Oaks).—Try the formula at vol. i. p. 86.

ANTIQUARY.—Should have told us what size the picture was required to be. We can only suggest now a whole or half-plate portrait lens. We do not think that any patent stands in the way of the experiments referred to. The lens is worthless in a photographic point of view. We think the calotype cheaper than the collodion process. The other suggestions are received with thanks, and shall be attended to. We would willingly open our columns to "Antiquarian Photography;" will our correspondent commence the subject by favouring us with a few notes on the subject?

AMOR SCIENTIÆ.—The subject of photographing by means of the electric light is one which has frequently occupied the attention of scientific men; we ourselves have tried many experiments on the subject. Its great expense, however, and the uncertain character of the light, will, we fear, prevent its coming into much use until great improvements are effected in the apparatus necessary for its production.

W. H.—Send an address, and we will communicate with you on the subject.

SILICON.—It would be hopeless for any one who has only a knowledge of the mechanical part of glass grinding, to attempt the construction of a portrait combination. Very high mathematical skill is required.

PROMOTER.—1. Filter through a double thickness of filtering paper, and pour the filtrate back again once or twice; it will then come through clear. 2. Add a few grains of cadmium filings.

HALCYON.—1. Place the camphor in the clear filtrate. 2. Animal charcoal is preferable. 3. Yes. simply draining it. 4. Only once. 5. Throw it away.

C. H. P.—We do not think the stamped card-board mounts for stereoscopic paper transparencies are to be obtained in England.

J. T.—No practical process has yet been described.

G. H. W.—By all means attempt to produce a good negative at once: intensifying a positive does not give very perfect pictures, and it is far more trouble.

TETRATHIONIC.—See page 180.

W. G. P.—Our expanding camera has a body similar to an accordion; we have tried several, and think this plan the most perfect.

T. P. C.—1. The process you mention is a very bad one, and will never give you satisfactory results. 2. Albumen, 1 ounce; chloride of ammonium, 12 grains. 3. No. 3 is in type now, and can be procured through any of our agents.

D. N.—The plan you suggest will answer very well, but in that case the ordinary collodion process may be used instead of collodio-albumen. To print a transparent positive on a collodio-albumen plate, it is only requisite to press the negative and sensitive plate in contact, and expose to day or lamp light for the proper time (which must be found out by experience), and then to proceed with developing and fixing, as previously recommended.

F. V. B.—See answer to G. H. W.

ABERTAWE.—We will endeavour to give a short account of the waxed paper process shortly. We once wrote a pamphlet on the subject, which was published at Chapman and Hall's. Try English photographic paper, soaked in hydrochloric acid, as recommended above.

ONE OF DEVON.—A friend of ours, *a Cornishman*, and an ardent photographer, intends shortly to visit Exeter, and is anxious for an introduction to "One of Devon." Have we permission to divulge our correspondent's address?

F. AND A. H. SMYTH.—We must know all particulars before we can do as you request.

J. HOLROYD.—We do not know by what particular part of the process the transparent enamel photographs mentioned in our last number are taken. Perhaps some of our correspondents will favour us with information on this point.

J. F. M.—Can you not tell how the cement is made? Is it Indian rubber in benzol? We should like to have one of the labels. Many thanks for your polite wishes. We have two agents in Aberdeen, and should like to establish an agency at Dundee, if you can favour us with the name of any person who would become one.

STEREO.—A camera with twin lenses 3½ inches apart.

P. M.—1. The same thing. 2. Explained in an early number. 3. Very difficult without special apparatus. You would not be able to manage it without going to some expense. 4. Accent on the *tog*. 5. We prefer them.

J. MOULE.—In our next.

ANNIE.—The information required on the subject of Photographic Societies, will be found in the "PHOTOGRAPHIC NEWS ALMANACK," which was published with No. 11. We have hardly decided, but we think six months. Our correspondent concludes her letter with the following recipe, which will, doubtless be of use to many of our readers this weather:—*Photographic Remedy for Chilblains.* If when they begin to be troublesome a little uniodised collodion be poured on, the ether evaporates, and leaves a thin insoluble coating, which prevents the skin from breaking, keeps off the air, and effectually cures them.

Communications declined with thanks:—W. H.—J. M.—Old Hypo.—F. W. W.—John.—Seacole.—T.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "PHOTOGRAPHIC NEWS:"—A Novice.—A. F.—J. L. M.—O. W.—Mephistophiles.—B. C. P.—R. S. L.—O. E. N.—A Young Beginner.—O. S. S.—Laura.—B. R. K. O.—Xmas.

IN TYPE:—Norma.—J. M.—T. Warwick.—H. C. J.—P. C.—Viator.—R. W. H.—J. T.—H. S. I.—S. S. B.—H. T. T.—One of Devon.—W. H. W.—C. F. B.—T. B.—An Amateur.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. CROOKES, care of Messrs. Petter and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 17.—*December* 31, 1858.

PHOTOGRAPHY APPLIED TO ENGRAVING ON WOOD (XYLOPHOTOGRAPHY).

IN accordance with the intention expressed in a previous number, we lay before our readers a description of a method we have devised for printing photographs direct on to wood; but before we describe our mode of proceeding we will offer a few remarks on wood-engraving, which may be interesting and instructive to most of our readers.

The art of engraving wood-blocks is coeval with the invention of printing; indeed, it would have been strange if it were not so, as the art of engraving letters in the old block-books would have suggested that the same process might be employed in reproducing figures of men and animals, and the rest would follow with improvements of the art. If we may assume that the date which the oldest engraved block in existence bears is correct, the art of engraving figures on wood was practised previous to the discovery of the art of printing. The block we refer to is that known as the "St. Christopher," and bears the date of 1423, while printing was not invented until 1437. Since wood-engraving has been practised there has been but little improvement in the tools employed; and if the engravings on wood are more beautiful than they were some years since, it is due to the superior skill of the engraver. The mode usually employed of preparing a block for engraving is, to whiten the surface with a mixture of flake-white and weak gum-water, either with or without the addition of a little finely-pulverised bath-brick; this is usually applied with the finger, and is rubbed off when dry. The object of this preparation is to give a surface which shall render the lines drawn by the designer distinctly visible to the engraver, whose duty is to engrave the block according to the design given. It is clear, therefore, that it is of the utmost importance for the design to be perfect, inasmuch as the beauty of the engraving depends chiefly on this being the case; hence the necessity for paying a high price for good designs. To give some idea of the cost of these, we may mention that as much as £6,000 have been paid by an eminent publishing firm for the wood-cuts which illustrate two volumes of a highly popular work now being issued by them.

Since the discovery of photography, frequent attempts have been made to take photographs on wood-blocks, but, we believe, with little success. The various operations it was thought necessary that the block should undergo before the photograph was finished ready for the engraver, occasioned the partial disorganisation of the fibres of the wood, which was thus rendered soft and unfit for the purpose. Various attempts have been made from time to time to overcome this difficulty; and among the most recent attempts to print a photograph on wood is that of Mr. Newton, who patented his process at the commencement of this year. We have not a copy of his specification at hand, but as far as our memory serves us, his process was as follows:—He took a limpid varnish and with it saturated the pores of the wood; this varnish was composed of a mixture of asphaltum, ether, and lamp-black, which was rubbed into the surface of the block with a piece of leather until, as we have already said, the pores of the wood were saturated. Collodion was then poured on in the same manner as on the glass plate, and sensitised in the silver bath, which was somewhat stronger than is usually employed for sensitising glass plates, and then exposed in the camera. It was afterwards developed with a solution composed of sulphate of iron, acetic acid, alcohol and water, and fixed in a solution of cyanide of potassium, and washed.

In previous processes of this description it was the custom to *coat* the surface of the block with varnish, in order to prepare it for the reception of the collodion film, which was transferred from a glass plate to the varnished surface. As may readily be imagined, the thickness of the united films, apart from any other reasons, must have seriously interfered with the operations of the engraver; and it appears to us that in this respect Mr. Newton's process could only mitigate the evil; and consequently, as far as we are aware, the process has not been very extensively adopted.

We now proceed to detail the result of our experiments, and we believe it will be found in practice that our process is free from those drawbacks we have indicated. We take a suitable block and cover it, in the darkened laboratory or by candlelight, with a mixture composed of *oxalate of silver* and water, to which may be added a little gum or pulverised bath brick, to suit the convenience of the engraver. The mode in which the oxalate is spread over the surface is precisely the same as that we have mentioned as being employed by wood-engravers in applying the mixture of flake-white and gum-water. A little of the substance, that is to say, about as much as would lie on a fourpenny piece, for a block four inches square, is sprinkled on the surface, and, the finger being then dipped in water (either with or without the addition of a little gum), the mixture is spread evenly over the whole surface of the block by rubbing the finger backwards and forwards across the block in various directions, until the evaporation or absorption of the water leaves the surface impregnated with a delicate and almost impalpable coating of oxalate of silver. The block may be then placed in a drawer, or any other place from whence daylight is excluded, and there left till dry, or for any length of time until required, as we have detected no deterioration or loss of sensitiveness, even in blocks which had been prepared six months ago, so long as they remained protected from the light. Oxalate of silver is susceptible of being acted upon by the actinic rays, and when the block has been prepared in the manner above indicated, it is only necessary to expose it under a negative in the printing frame to sunlight, and a positive picture is obtained in the same manner as on paper prepared in the ordinary way. The block requires no

subsequent washing, nor any preparation of any description, before being placed in the hands of the engraver; so that he receives it in precisely the same condition, as regards the surface to be operated upon, as under ordinary circumstances. The engraver, however, must not expose the block to the direct action of the solar rays while working at it, or it will gradually blacken on the surface; exposure to diffused daylight, however, has no deleterious effect on it, unless it be continued for a great length of time—say several hours.

We have before us, at this moment, a block on which a portrait was printed by exposure under a negative in the printing frame a fortnight ago; and, although it has been repeatedly examined and exposed to daylight, the portrait is as distinct, in every respect, as though it were printed on paper; and all that is required to keep it so is to preserve it from prolonged exposure to the light, which can be easily accomplished anywhere, it being only necessary to turn it face downwards on the table.

The advantages which may be derived from the adoption of our discovery are numerous. Among them may be enumerated the cheap and rapid transference of pictures of all kinds to the wood-block; and this rapidity is not one of the least of its advantages: for example, in the case of the *Illustrated London News*, it must not unfrequently happen that the same mail which brings the details of our operations in China brings also sketches from its artist there of the scenes of these operations. Now, everybody knows how rapidly the interest in such matters dies away in our busy country, and consequently how necessary it is that these sketches should be given to the public with the least possible delay. Such delay, however, must necessarily occur when these sketches have to be copied on to the wood-block by a draughtsman previous to the engraver commencing operations; but if this sketch be handed over to a photographer, he can, in the course of a few minutes, take a photographic copy of the exact dimensions required, which, in a very little time longer, can be transferred to the block, and the block be in the hands of the engraver. Besides the advantage of rapidity, the small cost at which the drawing can be transferred to a block would render it easy to have two or more blocks, so that when the first block showed signs of wear a second could be substituted for it—a very important consideration when an immense circulation is taken into account; and this applies equally to illustrated periodicals which have a very large circulation—in some instances extending to hundreds of thousands, require several duplicate blocks of the same subject to be taken by the electro-type process, in order to obtain a perfect impression, as apart from the question of time the wood would become irretrievably damaged. There is at present little probability of metal plates superseding wood-blocks in printing with type, and it is therefore of great importance that the drawings on these blocks should be made with the greatest exactness, and this can only be adequately attained by means of photography. It is not necessary that we should enumerate all the cases in which this extreme correctness is absolutely essential to convey a correct idea of the object sought to be represented, but we may mention the reproduction of anatomical subjects, of enlarged microscopic objects, and, generally, of all animals and vegetable specimens. We see no reason either why it may not be applied to the reproduction of stereoscopic views, which would, indeed, bring the stereoscope within the reach of the humblest classes. Of course the beauty and correctness of these views would depend, to a certain extent, on the skill of the engraver; but most engravers would succeed in producing a block which would be sufficiently correct for the purpose. Again, with respect to reduced photographic copies of maps or plans required to be printed with type, the reduced copies can be transferred to the block with the most perfect accuracy as to scale.

ON AN ACTION OF LIGHT HITHERTO UNKNOWN.*

BY M. NIÈPCE DE ST. VICTOR.

I HAVE now to speak of another series of experiments, but still of the same kind.

A sheet of Swedish paper sized with starch only, and impregnated with a weak solution of soda, potassa, or cyanide of potassium, and insolated for about three hours, gives with tincture of curcuma a yellow picture in the part insolated, and red in the parts not acted upon by the light. If the paper is heated, it carbonises very rapidly in the insolated part. Swedish paper not sized with starch does not produce the same effect.

A sheet of paper sized with starch, such as is sold in commerce, insolated for about three hours, causes the blue tincture of turnsole to redden in the part insolated; besides this the size will be found to have been removed from the paper, or at all events to have changed its nature, inasmuch as the water penetrates immediately through the insolated parts.

The effect is still more sensible when the paper is impregnated with soda, potassa, or iodide of potassium; but a paper sized with gelatine does not become unsized under the influence of light, in the time in which a paper sized with starch does.

Ozonometrical paper, composed of starch and iodine of potassium, according to M. Cloëz colours under the influence of light; that depends on its degree of hydration, for if it is thoroughly dry it does not colour, but it becomes blueish the instant it is plunged in acidulated water.

Ozonometrical paper composed of red turnsole and iodide of potassium, slightly moistened and exposed to the action of the light under a negative, and passed in water after insolation, gives a blue picture in all the parts acted upon by the light; the parts not acted upon remaining red.

Under the influence of light, a paper impregnated with a solution of nitrate of uranium, especially if it is neutral, colours of a rosy gray tint more or less deep, according to the degree of moisture it possesses. The picture would have been coloured a very intense slate gray if it had been impregnated with a solution prepared in the following manner: take nitrate of uranium 10 per cent.; nitrate of copper 5 per cent.; and yellow oxide of uranium 2½ per cent., and heat to render the liquor entirely neutral.

If with this same compound a design is traced on paper, and exposed quite moist to the solar rays, in a very short time a colouring will be perceptible under the influence of the light; and what is extraordinary is, that this colouring disappears in obscurity, and reappears on being again exposed to the light, and this may be repeated a great number of times; but eventually the colour entirely disappears.

For the colouring to take place rapidly, it is necessary that the paper should be neither too moist nor too dry, a slight humidity is the most suitable. The colouring ensues rather rapidly even in diffused light; the longer the time of exposure, the greater its intensity, and the longer the time necessary for it to disappear in obscurity; if the exposure has been too long, the paper will always preserve a greenish-yellow tint.

A sheet of paper sized with starch, such as is sold in commerce, insolated under a glass negative, and passed in darkness in a somewhat concentrated solution of iodide of potassium, gives a red-brown picture, which becomes blue directly it is plunged in water; this reaction renders evident the weakest actions of the light on the starched paper.

A sheet of paper of commerce, sized with starch, exposed to the action of the light for about three hours, with half of its surface protected by a screen, and then after insolation plunged into a dish containing an alkaline solution of indigo, and left there for a few minutes, and afterwards passed in water, will, under the influence of the oxygen of the atmosphere, become of a blue colour in the part insolated,

* Continued from page 159.

while the part not insolated remains white. In the case of a similar sheet of paper, treated in the same manner, and plunged in a solution of sulphate of indigo, it is the insolated part which becomes white, and that which has not been acted upon by the light remains blue; the colouring becomes much more sensible if the paper is dried by heat and passed in a hot bath.

Logwood gives a red colouring to the insolated parts. The sheet of paper, treated in the same manner, gives no appreciable results.

It would be of importance to repeat these experiments, not only in the luminous vacuum, but also in the different gases; unfortunately it has not been possible for me to do this.

I have now to speak of stuff impregnated with salts of uranium.

If two pieces of cotton tissue be impregnated with a solution at 20 per cent., and then exposed to the sun, the one wet and the other dry, and half of each piece protected by a screen, it will be seen after an hour's insolation that the part acted upon by the light is greatly altered, but principally in the wet stuff. If this portion be kept in darkness and freely exposed to the air, the alteration will be seen to continue, and augment from day to day as long as the acquired activity endures, ending by its being completely carbonised, and assuming a very deep brown tint; the parts protected from the contact of the light by the screen preserve their tenacity.

The colouring which stuffs impregnated with salts of uranium assume under the influence of light is always stronger when these stuffs are wet than when they are dry, and it is the same with the alteration; the less acid the solution of nitrate of uranium, the more the stuff colours, and the reverse is the case when the acidity is augmented: but the alteration is always in relation to the degree of acidity, or of concentration of the nitrate of uranium solution.

However, the alteration of the stuff impregnated with a salt of uranium does not depend exclusively on the acidity of the solutions; in fact, after I had rendered the solutions almost neutral, by dissolving therein with heat oxide of uranium until saturated, the alteration was nearly the same; it was stronger, in the same circumstances, when the stuff remained saturated with water during the whole time of insolation.

Comparative experiments have proved that stuffs impregnated with acidulated water, containing 2 per cent. of nitric acid, have been less altered than those which were impregnated with a neutral solution of nitrate of uranium.

Finally, experiments, still comparative, demonstrated that it suffices to insolate for about two hours a tissue of cotton or thread steeped in pure water, for it to be altered in a sensible manner, more especially if the tissue is impregnated with a little soda or potassa. Here is, without doubt, the reason why our linen is so speedily rendered unfit for wear; it would not be the case nearly so soon if it were always dried in the shade, and still less quickly if dried in darkness.

The following experiment has shown how much more rapid the action of the light is on moistened bodies than on dry ones:—Two pieces of cotton, the one wet and the other dry, as I have just now said, insolated, and after the insolation, if a solution of nitrate of silver be poured on them, the silver will be seen to be reduced very rapidly in the insolated part of the wet tissue, while the reduction takes place very slowly and feebly in the insolated part of the dry tissue. But the reduction would be more rapid and stronger if the tissue had been heated to a temperature of 120 to 140 degrees. The same will be the case with a sheet of paper.

Another important fact is, that all the activity acquired by an insolated body is destroyed directly it is employed to reduce the salts of gold and silver. Thus, when a stuff, impregnated with salt of uranium and insolated, has been passed in a solution of gold or silver, in reducing these metals it becomes coloured, but it alters no further, because it has lost all its activity. In further confirmation of this I may state, that a stuff impregnated with nitrate of silver, and insolated under the same conditions as with the nitrate of uranium, does not alter sensibly, while the stuff impregnated with nitrate of uranium is altered very speedily. This difference evidently arises from the former reducing at once the salt of silver in losing its activity, while the second preserves the activity communicated to it by the light. I may observe, with respect to this part of the subject, that if two pieces of cotton, dyed, one with indigo, and the other with prussian blue, are exposed to the light for the same length of time, the first will scarcely be altered either in its colour or tissue, while the second will be greatly altered in every way. The first will hardly reduce the salts of silver, whereas the second will reduce them very strongly. A white cotton tissue would have been more altered than that dyed with indigo, and less than that dyed with prussian blue.

Before terminating I may say that my experiments have demonstrated to me that the different earths, vegetable substances and others, are susceptible of acquiring in a very high degree this activity which the light communicates.

Thus earth taken from a certain depth below the surface, say a yard for example, will make no impression on a sheet of paper prepared with the chloride of silver; but, if a layer of mud formed of this earth be spread on a metal or glass plate, and, after it has become desiccated, it be exposed to the sun, taking care to mask a part with a screen, and afterwards applied on a sheet of sensitive paper, it will be seen that the insolated part acts very strongly on the sensitive paper, while the part screened from the light gives no impression.

Every kind of earth when insolated is capable of acquiring great activity.*

In conclusion, these experiments demonstrate:—

1st. That, for the action of light to take place on organic or inorganic bodies, it is necessary that the substance should be finely divided, and in very thin layers.

2nd. That, for the reduction of a metallic salt, it is necessary that it should be placed in the presence either of an organic substance or of one of these three simple bodies—chlorine, iodine, or bromine.

3rd. That, the organic substance has the same necessity, after having undergone the action of the light, of being placed in the presence of inorganic matter.

[It appears likely that the experiments of M. Nièpce may become as interesting to agriculturists as to photographers. We do not profess to be strong on matters pertaining to agriculture, that being a branch of science to which we have paid but little attention. We believe, however, that it is generally supposed that the earth is rendered more fertile by being exposed to contact with the air, while it appears that this increased fertility is owing to the action of the light. The action of the solar rays, too, on tissues impregnated with the nitrate of uranium, as well as on those not so impregnated, both being as it were decayed, is not without importance. As a matter of fact, we believe that housewives have long been aware that the exposure of linen to the air "rots" it, without their knowing that this effect is not produced by the air, but by the light, and more especially by sunlight.—ED.]

GENERAL OBSERVATIONS ON PHOTOGRAPHIC POSITIVE PROOFS.†

BY MM. DAVANNE AND A. GIRARD.

ON SENSITISING.

THE object of the operation designed under this name is to deposit on the fibres of the paper an argentiferous compound susceptible of being afterwards acted upon by solar radiations, so as to constitute the photographic proof.

* I propose to continue my experiments on vegetation and the ripening of fruits, under the influence of the activity acquired by an insolated body. I have already obtained a result on grapes, enclosed in paper bags impregnated with tartaric acid.

† Continued from p. 162.

This is generally effected by placing the sheet of paper on a solution of nitrate of silver, the strength of which, and its composition also, is greatly varied by the manipulator, either intentionally or accidentally.

If in this operation sheets of paper be employed impregnated with an alkaline chloride, as is usually the case, the salt of silver has a double action, one part is converted on contact into an insoluble silver compound, while the other part is imbibed by the porous paper, and remains in the condition of a soluble nitrate, each, it seems probable, acting in different ways.

From this simple proposition there result, as will be seen, several points for examination, some arising from the action of the bath as it has been originally prepared, others arising from the condition of the bath after its composition has been modified by the preparation of papers, either in respect of its neutrality, or of the foreign matters, mineral or organic, that have been introduced.

1. The strength of the silver bath may exercise a direct influence on the production and the value of the proof; besides which, each sheet that is prepared in the bath impoverishes it to a certain extent, and it is thus a matter of some importance to determine this impoverishment, and the action it exercises on the final result.

2. The proof may perhaps be abandoned to the action of the silver bath for variable periods, and these variations may cause differences in the result.

3. The photographic operations lead to important changes in the condition of the bath. It may become either acid or alkaline, and under certain conditions may become ammoniacal. Looking at it in respect of its neutrality, it is advisable to endeavour to ascertain the influence exercised upon it by the nitrate of silver, according to whether this preparation be employed in a crystalline, white fused, or gray fused condition.

4. The successive double decompositions which take place on contact with the salted papers, add to the silver bath different nitrates, the bases of which are borrowed from the chlorides used in salting the paper, and these different nitrates may perhaps in certain cases influence the definite result.

5. The different organic matters employed in the sizing of the paper, partially dissolving in the silver bath, may alter its purity.

6. Finally, as a general corollary of the preceding statements, it is important to examine the extent of the influence which the different circumstances we have enumerated have on the preservation or the alteration of the sensitised papers.

Of the influence of the strength of the bath.—If a sheet of paper be taken that has been salted in a solution containing five per cent. of salt, and divided into four parts, and left for the same period (five minutes), the first in a silver bath of 24 per cent., the second in a bath of 18 per cent., the third in a bath of 12 per cent., and the last in a bath of 6 per cent., and all four taken (dry of course) and exposed under the same negative, only a slight difference will be perceived in the rapidity with which they are acted upon. It will be observed, however, that the papers most rich in silver, colour least rapidly. When the insolation has been deemed sufficient, and they have been washed and fixed in a new hyposulphite of soda bath, very sensible differences will be observed in their appearance, especially while they remain in the water. The result is to all appearance the same, whether albumenised paper has been used or not; but it is, perhaps, less marked in the first case.

These differences are of two kinds; they affect the delicacy and colour of the proof. In order to at once place ourselves in a position to examine these differences, we will take the two extreme examples; we will compare the proof coming from the bath at 6 per cent. and that from the bath at 24 per cent. The first is of an almost uniform, dull tint, and of a reddish tone; the other is clearer and fresher, the whites well preserved, and the blacks coming out boldly. Between these two extremes the red tone will be seen to diminish, and the brilliancy to augment by a regular progression in proportion to the augmentation of the strength of the silver bath; thus the proof prepared on the bath at 18 per cent. is superior to that prepared on the bath at 12 per cent., and so on in proportion. The difference between the proof derived from the bath at 18 per cent., and that from the bath at 24 per cent., which is very sensible on its removal from the finishing frame, partly disappears under the action of the hyposulphite; on the other hand those from the 12 per cent. bath are not quite clear enough: we therefore think that the best strength will be 18 per cent.

These results do not arise from a difference of energy in the sensitive composition; for if each piece of paper be left in the printing frame during a period inversely proportionate to its richness of silver, the same differences will still be exhibited, and even in a greater degree.

Thus, then, the strength of the bath exercises a well-marked influence; its augmentation, up to a certain point, adds to the beauty of the proof by giving more sharpness and delicacy to its outlines, while its diminution lends to the equalisation of the tones and a strongly-marked red coloration. These are two distinct results, which we will examine in succession, seeking to establish their causes.

(*To be continued.*)

DRY COLLODION PROCESS ON PAPER.*

BY M. CORBIN.

I now proceed to point out the quantities I have adopted, and to give some details as to the operations.

The medium composition of the collodion I have used is as follows:—

Ether	650 parts.
Alcohol	350 „
Gun Cotton	15 „
Iodine...	$1\frac{1}{4}$ „

This is shaken; then allowed to repose a little; then decanted, and filtered through cotton.

It may be convenient to vary the above proportions a little, according to the temperature. Thus, in very hot weather, it may be necessary to augment the proportion of alcohol, in which case it will be requisite to increase the quantity of gun cotton; for I have observed that, the more alcohol the collodion contains, the more difficult its transference from the glass to paper. This difficulty can only be overcome by thickening the collodion by means of gun cotton. In winter, on the contrary, the proportion of both alcohol and gun cotton may be diminished.

It is worthy of remark how small a proportion of iodine is necessary. A larger proportion would give a less sensitive paper; in this sense, that for the same pose it would give more opposition of tones.

The collodion is poured on the glass in the usual manner; and when the ether and the alcohol have sufficiently evaporated, it is nitrated, by immersing it in the following bath:—

Water	100 parts.
Nitrate of silver	1 „
Nitric acid	$\frac{1}{4}$ „

The small proportion of silver in this bath is remarkable. After the lapse of two minutes the glass is withdrawn, and presents a very clear opal tint. If the film of iodide of silver is unequal, and in a pulverulent state over the whole or part of the surface of the collodion, this will be a proof that the collodion film was not sufficiently dry at the period of its immersion in the bath, and the operation must be gone through afresh. The glass being nitrated, it is washed, by immersion for two or three minutes in a dish filled with rain or river water.

On taking it from this dish, it must be washed under a tap; its surface must then be covered with a solution, consisting of 1 part of iodide of potassium in 100 parts of water. The glass being covered in every part, the superfluous portion is drained into the bottle, and the plate again washed under the tap.

* Continued from p. 183.

To facilitate the transfer of the collodion on to the paper, it is advisable to pour on the surface of the glass, water acidulated with one-fifth of its volume of nitric acid. Finish by washing with water under a tap.

Take a sheet of good gelatinised negative paper, a trifle smaller than the glass (the gelatinising of the paper is effected by placing the best side on a lukewarm bath, formed of 6 parts of gelatine to 100 parts of water—the sheet is then suspended to dry), and immerse it in water until well saturated; then place, the gelatine side downwards, on the collodionised glass, taking care not to allow air to remain between the paper and the collodion surface. The enclosed water is expelled by means of a triangular piece of glass passed lightly over the surface of the paper; the edges of the collodion, which extend beyond the paper, are turned over, and the paper and collodion removed together.

The paper, thus collodionised, is laid on a glass, the collodion upwards; the preservative liquid is poured over it, and it is then hung up to dry. To prepare this preservative film, 10 parts of honey or glucose to a little more than 3 of water, and the white of one egg, are placed in a pipkin over a fire; after a short time the mixture is in a liquid state; heat is still applied, until there is an abundant scum formed on its surface; the liquid is then clarified; it is filtered through paper, and preserved in a closed bottle.

Fermented albumen is prepared, by putting in 25 parts of albumen to 1 of honey or glucose. After the expiration of a day or two, carbonic acid will be liberated in abundance, and the albumen will acquire a perfect fluidity.

To prepare the preservative liquid, equal volumes of fermented albumen and syrup of honey or glucose are mixed together, and filtered through paper. This liquid will pass easily through the filter if the albumen has fermented well.

This mixture must not be prepared long beforehand, or in a few days it will begin to ferment, when the sugar will be converted into alcohol, and the albumen be precipitated.

The process is not nearly so complicated in practice as it appears at the first glance. The different washings of which we have spoken occupy but very little time; and the operations in no way differ from those necessitated in the albumenised collodion process on glass, except in the transfer of the collodion to paper, an operation which is very simple in practice.

This process is evidently preferable to that which consists in detaching on paper a negative obtained on collodionised glass, for one has hardly the courage to run the risk of deteriorating a fine negative by transferring it. There is, besides, the advantage of being able to prepare, in one's leisure moments, or to buy ready prepared, a supply of collodionised paper, that may be kept or taken on a journey without the least difficulty.

The operations which remain to be performed, on using the paper, are very simple.

The sensitising is effected by laying the collodionised side of the paper, for twenty or thirty seconds, on a bath prepared as follows:—

Water	100 parts.
Nitrate of silver	5 „
Acetic acid, crystallisable	5 „

If the bath is old and coloured, it should be rendered perfectly colourless by agitation with kaolin. After washing it with river water several times renewed, the paper should be suspended to dry. In drying, it wrinkles a little, but it is easy to get rid of this by passing a slightly warm smoothing iron over it. This wrinkling can be prevented by fastening the four corners to two parallel lines running one under the other. This fastening should be accomplished by means of the little clasps made for that purpose.

The exposure should last from three to five minutes, with a simple object glass of 3 inches diameter, for a view well illuminated.

The development is effected by floating the paper on the surface of a bath of gallic acid, strengthened with new aceto-nitrate of silver.

The fixing is effected with cyanide of potassium or hyposulphite of soda.

It is then washed, and left to dry. Finally, the negative is completed by waxing the non-collodionised side of the paper with white wax, which is spread about by means of a hot iron, and the excess removed between blotting paper.

It is evident, that gelatine being soluble in water at 60 degrees, if the collodionised paper is dipped in a bath of a higher temperature, the sizing will be dissolved, and the collodion detached from the paper. It is necessary, therefore, during the heats of summer, to wait until the evening to perform the operations of sensitising and developing, or else to operate in a cellar. Liquids should be employed that have been cooled by lying in a cool place or in freshly-drawn well water.

An elevated temperature exercises no hurtful action on the dry paper.

THE MOLECULAR ACTION OF CRYSTALLINE PARTICLES.*

BY DR. A. WELLER.

Other polished surfaces may be used instead of the glass plate, and I have formed these images on quartz and agate with the same effect. The difference of crystalline texture exerts no influence, but the images seem to be with more difficulty produced on polished silver and copper than on a vitreous surface. A very slight degree of friction will excite the formation of an image, although a moderate degree of pressure is more favourable. Electricity exerts no influence in the formation of these images. In one experiment, in order to diminish the friction, I adapted two fine wires, of a spiral form, to a battery sufficiently strong to decompose water freely. These wires were moved through the solution in various directions, and the marks of the passage of the two poles became equally apparent without any difference on either side, and when afterwards disconnected from the battery, and used in a similar manner, they produced the same effects. It is remarkable with what fidelity the traces of lines become visible in this manner. Letters thus formed by a pen are much more faithfully rendered than when written on paper with ink, and lines may be formed which are scarcely visible to the naked eye. Microscopic inspection shows this extreme exactness to a much greater degree than could have been anticipated—for we see a simple line become, as it were, decomposed into a number of parallel lines, which represent the point of contact between two solids. These lines are composed of very minute and confused crystals, of an irregular appearance, and joined together. Their diameter varies from 0·02 of a millimètre to about double that size. Between these parallel lines are frequently seen others still more minute. The other crystals which become deposited by the common crystalline power over the untouched parts of the glass are much larger than either of these. When the point of intersection of two lines is examined under the microscope, we perceive the appearance represented. While crystalline masses are in process of formation, it is impossible to prevent the deposition of crystals on other parts of the glass, but if while these are fresh they are subjected to a sharp current of water, the irregular crystals are mostly carried away, while the images are left almost intact. It is, therefore, evident that the same power which causes this deposit renders them more adherent to the surface of the glass than the other crystals. Another mode of demonstrating the difference of their adherence is by allowing the solution to dry on the glass, when, by brushing it slightly with the feather of a pen, most of the irregular crystals are taken off and the images remain.

Other substances are capable of forming a like deposit. Chloride of platinum and nitrate of potash, mixed together, form a double chloride, with which images can be obtained with as much ease as with the double phosphate. The only difference is that the double chloride precipitates in the shape

* Continued from page 183.

of octahedrons, &c. Solutions of tartaric acid and nitrate of potash deposit crystals of bitartrate of potash, which are capable of forming upper and lower images with nearly as much facility as the double phosphate. The lower images formed by the bitartrate differ in one respect from those by the phosphate, for shortly after their formation they appear to lose their adhesion to the glass, and the slightest agitation of the liquid causes them to be detached; and if a sentence has been written, the curious appearance is presented of fragments of words and letters floating about in confusion. Under the microscope, also, they differ; fewer parallel lines are perceived, and the crystals are larger and unequal in size. Liquor potassæ, added to a solution of tartaric acid, will form images similar to that just mentioned. Caustic soda and tartaric acid produce the same result, but the solution must be much more concentrated.

Images formed by gaseous bodies.—These traces are formed in the same manner as those which are crystalline, by passing a solid body over a piece of glass covered with a liquid containing a gas in solution, when they are immediately perceived by the bubbles which are deposited. On account of the specific gravity of the gas, these images are not very durable, for after a short time, the gas which composes them arises to the surface. As a general rule, the ingredients, whose combination causes the formation of gas, should be added together gently, and so diluted, that whatever gases are formed they remain dissolved in the liquid. I have been surprised to find how much gas may be in this way made to remain in solution; and as most of them appear capable of being dissolved in this unstable manner, traces may be obtained from them all, and I have ascertained by experiment, that such is the case with carbonic, acetic, and hydrochloric acids. To obtain carbonic acid, I have generally used subcarbonate of soda and tartaric acid. Acetate of ammonia was employed to liberate acetic acid, and hydrochloric acid was obtained from common salt and sulphuric acid. A mixture capable of forming traces has the property of disengaging its gas in bubbles whenever it is brought in contact with any dry surface; as, for instance, when a mixture of this sort, formed on a slip of glass, is caused to spread over a part of the surface which has not previously been wetted, bubbles of gas are immediately evolved on that spot, although none are perceived elsewhere. This effect is also produced with champagne, seltzer, and other effervescing waters, which, however, have not the property of forming gaseous traces. Any surface, whether metallic or non-metallic, will be found to effect the separation of the gas from the liquid, and I have not perceived that there was any difference from the surface being perfectly polished or rough.

(*To be continued.*)

APPROACHING PHOTOGRAPHIC EXHIBITIONS.

NO. III.

Under this heading we have from time to time acquainted our readers with the progress made in the formation and collection of the various Exhibitions. Already the Architectural Photographic Association have opened their Exhibition, in the Rooms of the old Society of Water Colour Artists; for an account of which we refer our readers elsewhere.

It will be recollected that, on previous occasions when we have alluded to "Approaching Exhibitions," we have thrown out hints, and commented on the best mode of furthering their interests. In some quarters these suggestions were at once seen to be practicable and sensible, and were accordingly acted upon. In one, however, our comments upon this the strangest of resolutions seemed only to have a tendency to confirm, rather than to relax, a stringency which was so fraught with danger. We need hardly say that we refer to the resolution which the Council of the Photographic Society passed, in August, to the effect—"That no Photographs would be admitted that had been exposed in shop windows, or otherwise publicly exhibited in this country."

On that occasion we called the attention of the Council to the matter, and said—"The Council have passed a resolution which has astonished not only us, but many others. . . . . . We are sure that, if they will only reconsider the subject, they will see that there has been a *degree of precipitancy in passing the resolution, which will not stand the test of deliberation.*" We then proceeded to say that we had received remonstrances on the subject, and that "the resolution could excite but one feeling—that of disapproval; that it seemed to us, indeed, to be a most resolute attempt to defeat the object of Exhibitions, because it would easily be seen that to exclude a photograph from an Exhibition simply because it had been exhibited in the shop windows, was a most arbitrary regulation, since many of our leading photographers had their respective publishers, and it was not likely that a publisher would so far forget his own interest as to withhold the publication of a photograph until it had been exhibited at the Society's Exhibition." We feel it due to ourselves to re-copy what we had urged so far back as October the 4th, in order to show that we were anxious that the Society should not suffer on account of a stupid resolution, and that the error should be rectified ere it was too late. The result of our remonstrance was a modification of the original resolution, stating that pictures exhibited at the Edinburgh Exhibition would be admitted. This we deemed insufficient, and again we urged a reconsideration of the subject, asking for either a rescinding of the resolution, or a very great modification of it. The Council, however, persisted in their resolution, on the plea that the step which they had taken was one "which was conservative of the dignity and professional interest of the photographer." We clearly showed the fallacy of this argument in a former number, but apparently to no purpose.

What now is the result? At the last moment they find things taking a turn which is *not* "promotive of the Society's interest," and, just as we had predicted, contributions are not found to flow in; the consequence is, that the Council have just rescinded the resolution as far as regards the present Exhibition, and we strongly suspect in regard to *future* Exhibitions also. It is, however, now too late to remedy the evil; already the schedules have been issued with the fatal resolve, and the hanging committee, panic-stricken, are running hither and thither, bearing for their motto, "The smallest donations thankfully received." It remains to be seen who has most at heart the Society's welfare—the "Photographic News," or its own Council? Indeed, by the insertion of this notice, we are doing more to destroy the ill effects of the resolution, than could possibly be done by any other means. We fear, however, that even the publicity of the enormous circulation of the "Photographic News" will hardly save the Society now from the prejudicial effects of this ill-advised resolution. We have, however, done our best, and if the collection of photographs at the next Exhibition of the Society be poor and scanty, the public will not have much difficulty in finding out the parties really in fault.

Critical Notices.

EXHIBITION OF THE ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.*

The series of Venetian views, by Cimetta, is interesting on account of the associations connected with that city. We are not inclined to go into such ecstasies as some of our contemporaries have done on the subject of these photographs. We are inclined to look at them more from the photographic point of view, and to examine the pictures apart from their historical associations. There is a good deal of *breadth* in the style in which they are taken, and also great depth of colour. In fact, that is one of the drawbacks of the series. They are mostly printed too dark; this, of course, tends to destroy the detail

* Continued from page 186.

which would otherwise be observable. Anybody acquainted with the peculiarities of Venetian architecture, will know that it is full of elaborate and intricate detail, to which photography alone can do justice. These views are larger than any before published of Venice. We recollect seeing a series executed by Perini, not quite so large as the views of Cimetta, but far exceeding the latter in equality of tint, in half-tone and minuteness.

"The Palazzo Passi" (121) is wanting in clear definition, and there is scarcely any detail to be found in it. "The Bronze Gates of the Logetta of the Campanile of St. Mark" (123), is a subject well adapted to the massive character of these photographs, and the deep brown tone, which is unsuitable to many of these pictures, is singularly well suited to the subject. The elaborate ornamentation is heavy and massive, therefore no great delicacy of tint is desirable. Altogether this is about one of the most effective of these photographs—though we cannot help thinking that still greater effect would be perceptible if it were printed a little lighter so as to show the more minute detail. "The Canopy over the Door of Stephen's Church" (128), would, if well photographed, make a very good picture; it is, however, far from being successful. "The Bridge of the Rialto" (129), is an interesting subject, but it has been taken before by other artists with so much greater felicity, that we are almost astonished to find that it has a place in the collection. "The Railway Bridge, St. Stephen's" (130), has much of the characteristic haziness of these photographs, and the blurred prows of the gondolas have a somewhat ridiculous effect. One thing which must particularly strike every person who inspects these pictures is, that photography cannot give anything like an adequate representation of water. This, no doubt, is one of the causes of the inferiority of these pictures, but it is more particularly noticeable in this piece. "The Sitting Lion at the Arsenal" (131), is a massive picture of a massive subject. "The Chiesa della Saluto" (132), has always been a favourite subject with artists and photographers. When we recollect some pictures by Canaletto, and those more recently executed by E. W. Cooke, R.A., or the photographs by Perini, we need hardly say that we are dissatisfied with the photograph exhibited here. "The Bronze Horses, St. Mark's" (133), "The Recumbent Lion at the Arsenal" (135), are similar in character to (131). They would have been much better if printed less darkly. The object of the photographer in these pictures has evidently been to obtain a true picture of the leading objects, quite unmindful of the general effect; for, had he paid but common attention, he could with a little extra trouble have introduced much detail that could not have failed to be interesting. "The Logetta of the Campanile" (137) is a subject well adapted for fine effect; but here the pervading want of detail is painfully to be observed. For instance—the Bronze Gates, which form the exclusive subject of No. 123, are here very indistinct, while the bas-relief figures in the niches are scarcely discernible. Architecturally speaking, this picture is the most interesting of the series: yet the very defects pointed out are those most necessary to assist the architectural student in his studies. "The Bridge of Sighs" (144) is a wretched attempt at one of the most popular views of Venice. It has neither artistic feeling, light or shade, or anything that could recommend it, artistically or photographically.

It will be needless to mention the remaining pictures of this series: as we should only have to repeat our criticisms. The prevailing faults of Cimetta's series are, that they are printed too darkly; and the artist has evidently endeavoured to give quantity instead of quality. The views are too large; had they been smaller they would certainly have been more effective. Of one thing there can be no doubt, and that is, that Venice deserves a much better photographic translation than that given by Cimetta.

We come next to two small London views, by A. J. Melhuish, of Blackheath, and how strongly do these clear and definite pictures contrast with those just noticed. These are—"View from Victoria-street, Westminster, showing the Towers of Westminster Abbey" (155); "Victoria Tower, Westminster" (156). We are sorry that Mr. Melhuish has only contributed two such small pictures to the present collection. He is an artist calculated to increase the reputation of the association by his good pictures. He is always happy in the clearness of his photographs, and is generally successful in importing atmospheric effect into them. These views ought to have been taken on a scale and in a style commensurate with their importance.

(To be continued.)

Lessons on Colouring Photographs.

COLOURING POSITIVES ON GLASS—*(continued.)*

Second Colouring.—By colouring first, and then varnishing, several advantages have been gained. In the first place, the chief disadvantage of dry colours—their tendency to fade—has been to a large extent obviated; and in the next place they have, by combination with a transparent vehicle, lost whatever of opacity pertained to them. They have now, in fact, acquired something of the permanency and transparency of oil colours. But what they have gained in transparency they have lost in intensity, and to produce perfect results a second colouring is necessary. The combination effected between the varnish and the colour already applied, gives a biting surface on which any amount of force and brilliancy may be obtained. This circumstance, however, renders imperative the greatest possible care in applying the second colour, otherwise the delicate half-tones are easily obscured, and the beauty of the picture seriously marred.

Commence again with the face, and proceed as in the first instance, using throughout nearly the same tints, but of just such intensity as they are intended to possess in the finished picture, as no further modification is to take place, except what may arise out of judicious contrast in the colouring of the draperies and background. A pure delicate tint, similar to that we have described as No. 1 flesh, may be freely applied to the highest lights; now use the local colour, blending it with the lights and softening into the shadows of the face, the deepest of which may frequently, in the second colouring, be left untouched with advantage. If the first colouring has been judiciously managed, and has, after varnishing, left the shadows of a suitable and harmonising tint, they will, by being left untouched in the second colouring, retain their transparency, and add much to the depth and vigour of the picture. If they require touching to make them accord in tone with the newly-applied colour, a very delicate touch of the proper tint will suffice. Remember that beauty of colour will not compensate for the loss of the proper relations of light and shadow. Heighten the cheek with carmine, or carmine and rose, taking care to diffuse the colour naturally, preserving in this respect the characteristics of the sitter, and blending the carmine with the local colour. Touch the lower lip with carmine, taking especial care not to obscure its form, and to avoid touching the shadow which divides the lips. The upper lip, being in shadow, will rarely require any brighter tint than that it has already obtained in the first colouring.

The eyes, if a bright blue, will probably require touching again with the suitable tint. The corner of the eye, next the nose, may be touched with carmine. The eyebrows, if light, will probably require intensifying.

Examine the hair to ascertain if the varnishing has left it of the right tint, if not, add a little colour to the lights only.

The hands, neck, &c. may now be re-coloured, keeping them as delicate as may be compatible with the colour of the model. Remember that in this matter any deviation from nature, if it be in the direction of coarseness, is altogether unpardonable; whilst on the other hand, a little increased refinement will rarely be censured.

Proceed now to the draperies, and recolour them, if necessary, using the same care to obtain brilliancy in the high lights, and to preserve transparency in the shadows, as in the first colouring. The draperies in portraits of gentlemen rarely require any colour, except in uniforms, in which case they also generally require to be non-inverted. The best method of colouring these we shall describe in a future article. In colouring draperies, it will often happen that a certain amount of discretionary power is left with the artist, of which he will avail himself to use such tints as best harmonise with the complexion of the sitter, and give due value to the flesh tints; for it is in giving life, character, and beauty to the head that the chief attention of the colorist should be devoted, all other points being more or less subser-

vient to this object. It is very easy to completely spoil the flesh tints, and kill the whole colouring of the head, by an injudicious choice of surrounding colours. As a rule, masses of positive colour should be avoided in the draperies, keeping them judiciously subdued. Of backgrounds we shall speak in detail; and of the general principles on which harmonious colouring is based, we must treat in some distinct articles.

White lace, where it requires it, may be touched with Chinese white; but as we have said before, the less water colour used the better. Flowers may also at times be made effective by water colours, or, better still, by oil colours. Jewellery is often touched with the gold shell, but, unless carefully managed, it has a coarse, bedizened effect. We prefer water or oil colours if skilfully done, using orange chrome and burnt sienna for the shadows, and Naples yellow for the lights.

(*To be continued.*)

Photographic Chemistry.

ORGANIC CHEMISTRY—(*continued*).

Cellulose or Cellular Tissue.—The tissue of vegetables, of whatever kind they may be, is composed of elongated and parallel cells, formed of a substance, to which the name of cellular tissue has been given, and of a hard matter, termed ligneous tissue, which exists in the cells in greater or less proportions, according to the hardness of the vegetable. Cotton is formed almost wholly of cellulose; the wood of the oak is composed of cellulose and a large proportion of ligneous matter. The chemical composition of cellulose is always the same, and may be represented by C_{12} H_{10} O_{10}. Well manufactured and good paper may be considered as being composed almost entirely of cellulose—the rags from which it is made being scrupulously washed to free them from impurities of every description, and undergoing very numerous washings in the course of its conversion into pulp, and bleached by chemical re-agents. Cellulose may be obtained from all vegetable tissues. Thus, we have seen paper manufactured from the fibre of the cabbage-stump, from the fibre in the liquid manure of dairies, and from other substances equally unsavoury, and where the presence of cellulose, to most people, would be equally unsuspected.

If highly-concentrated nitric acid, or a mixture of nitric and sulphuric acid, or a mixture of nitrate of potassa and sulphuric acid, be made to react on the fibre, divers substances are obtained of an exceedingly inflammable nature; that prepared with carded cotton has been termed *gun cotton* or *pyroxyline*. Gun cotton dissolves with facility in a mixture of ether and alcohol, and forms the basis of collodion.

Starch is a white granular matter, which is found in the cells of almost all vegetables, whether they are cereal, tuberculous, or bulbous roots. The amylaceous product of the cereals has more especially the name of starch—that of potatoes being usually termed fecula. This body, whether it is termed starch or fecula, is a substance, the composition of which is identical with that of cellulose: its formula is the same, viz., C_{12} H_{10} O_{10}. Its presence may be detected by the blue tint communicated to any substance containing it by a solution of iodine.

Dextrine has the same formula as cellulose—C_{12} H_{10} O_{10}. Starch swells in water, but does not completely dissolve; if it is slightly torrefied, or if it be heated with very dilute acids, it becomes perfectly soluble, but is no longer the same substance; it is not starch, but a new body, to which the name of *dextrine* is given. It is extensively used as a substitute for gum arabic.

Glucose—the formula of which differs slightly from the preceding, being thus written, C_{12} H_{14} O_{14}—is obtained by a prolonged action of acids on starch; or otherwise, from the conversion, by fermentation, of the starch contained in barley into a peculiar kind of sugar, to which the name of *glucose* has been applied.

Pure sugars are substances perfectly neutral to red and blue litmus papers, and soluble in water. They can, under the influence of fermentation, be converted into alcohol and carbonic acid, but not without the addition of a ferment, as a solution of perfectly pure sugar does not contain in itself the element necessary to produce this action, although a solution of impure sugar does. Sugars are of different natures. There is a difference between the sugar obtained from the cane or the beetroot, the glucose of which we were just now speaking, the sugar of milk, &c. To place this part of our subject in a clear and precise form, we may say:—

Cane or beetroot sugar, C_{12} H_{11} O_{11}, is prepared by purifying and concentrating the juices of those vegetables.

Glucose, C_{12} H_{14} O_{14} is extracted from the juice of acid fruits by concentration; or prepared by heating starch with acids; or from carefully malted barley.

Sugar of milk, C_{24} H_{24} O_{24}, is obtained by evaporation of whey.

These sugars are easily distinguished from each other. The sugar of the cane or beetroot crystallises easily, and forms sugar-candy; on the contrary, it is very difficult to crystallise glucose. Both of these have a more distinct sugary taste than the sugar of milk.

Glucose and the sugar of milk decolorise, when hot, an alkaline solution of tartrate of copper, and produce therein a yellow precipitate of protoxide of copper; pure cane sugar has no action on this liquid.

We may add that all sugars reduce the salts of silver.

(*To be continued.*)

Dictionary of Photography.

AFFINITY (*continued*).—2. Another modification is caused by the *bulk* of the substances which react on each other in this way, and arises from the circumstance, that a very large quantity of a substance possessing a less degree of chemical affinity, is capable of overcoming the stronger chemical affinity of a smaller amount of another substance; or, in other words, and in more exact language, *quantity* is capable of sometimes making up for insufficiency of force. This rule, however, has many striking exceptions.

3. The differences of cohesion between bodies is another source of modifications. This is apparent, either when the tendency of a body to assume the solid or gaseous state is of itself sufficient to overcome all other kinds of affinity, or when another, weaker affinity, is added to this tendency, both unite in overcoming the more energetic affinity of bodies which, under other circumstances, would have remained in the liquid state.

For example—Carbonic acid is one of those which is most easily disengaged from its combinations with other bodies. This phenomenon does not only take place on account of its having a less powerful chemical affinity than most other acids, but because it has so great a tendency to become gaseous, that, however small the quantity of it which is expelled from its combinations, it immediately escapes in the form of a gas, so that it cannot accumulate in sufficient quantity to act by virtue of its mass.

4. Finally, the usual form of chemical affinity is further modified when several bodies are mixed together which are capable of reacting on each other. For instance—When two salts, such as chloride of potassium and sulphate of ammonia, are mixed together in solution, the composition of each undergoes a change, so that the strongest acid goes to the strongest base, and the other acid and base likewise unite, thus forming, in the case under consideration, sulphate of potassa and chloride of ammonium. It is hardly necessary to remind our readers that if these two latter salts had been mixed together no change would have taken place. This modification of chemical affinity has received the name of double affinity; and the change which takes place through its action is called double decomposition.

ALBUMEN.—Albumen is a body which is of very general occurrence in the vegetal kingdom; it exists in plants either in a coagulated state in their tissues, or in solution in the liquids which circulate therein. Albumen is also found in great quantities in the animal economy; the serum of blood and the white of an egg are essentially composed of albumen dissolved in water. Animal albumen appears to be identical in its composition and chemical properties with vegetable albumen, and many physiologists admit that this substance is furnished immediately to animals from the vegetables on which they feed. Albumen exists in two distinct states—*soluble* and *coagulated;* in each of these states it possesses, however, the same chemical composition. A good idea can be obtained of these two states by comparing the albumen of the white of an egg in the raw state with the same cooked. The albumen from the white of the hen's egg *(ovalbumen)* being that with which photographers are mostly concerned, we will confine our remarks to the characteristics of that body. *Soluble* albumen dissolved in water is a glairy, inodorous, tasteless liquid, of a colour varying between the palest yellow and perfectly colourless. It coagulates at a temperature of about 140°; but if kept exposed to the air at a lower temperature than about 120°, it may be dried up, when it forms a transparent gummy mass, which, however, will never perfectly dissolve again in water.

(To be continued.)

A Catechism of Photography.

GELATINE PAPER.

Q. Is not gelatine occasionally employed in photographic operations?

A. It is used in a similar manner to the albumen. Take about half an ounce of pure white gelatine and add to it 16 ounces of distilled water; when the gelatine is melted, add 75 grains of iodide of potassium—rapidly agitating the solution with a glass rod; about 350 grains of the aceto-nitrate composition is then to be added. The liquid so prepared is of a light yellow tint, which colour it retains for some time. When the solution is to be used, it must be placed in a china basin or bath, and the paper, to be prepared, must be allowed to rest six or ten minutes on its surface. The paper so prepared must be hung up to dry, and all the precautions observed which have been noticed in other processes. As soon as the paper is thoroughly dry, it must be immersed, so as to cover both sides in a solution of iodide of potassium and distilled water (15 grains of iodide of potassium to 3 ounces of water); after soaking in this iodide bath for six or eight minutes, the paper may be removed, thoroughly dried, and put away for future use.

THE COLLODION PROCESS.—WET COLLODION.

Q. What is collodion?

A. Collodion is a solution of gun-cotton in ether and alcohol. This solution gives a liquid more or less mucilaginous, which remains upon a piece of glass or other surface, after the evaporation of the ether and alcohol, a pellucid solid, perfectly transparent and homogeneous. It readily incorporates itself with iodide of silver, and thus produces a sensitive coating of extreme delicacy.

Q. With whom originated the idea of employing collodion as a basis of photographic operations?

A. Mr. Archer and Mr. Fry, in England. The discovery was made in the year 1851.

Q. What is the ordinary process for obtaining a picture on a collodion surface?

A. The operation may be thus indicated:—

1. The preparation of the collodion.
2. Cleaning the glass.
3. Application of the collodion to the glass.
4. Sensitising the plate.
5. Exposure in the camera.
6. Development of the image.
7. Fixing.

PREPARATION OF THE COLLODION.

Q. How is collodion prepared for photographic operations?

A. There are several methods adopted, with more or less success, by different photographers. All however agree in their leading features. The following plan is found to produce very good results:—Mix in a wide-mouthed bottle, perfectly clean, and rinsed with pure alcohol—

Rectified sulphuric ether	67 c. c.*
Gun-cotton	16 grains.

Agitate the bottle until the cotton is thoroughly impregnated, and the whole of its fibres separated from each other. Add, in small quantities—

Rectified alcohol	33 c. c.
Iodide of cadmium	16 grains.

The cotton is immediately dissolved, but the solution must continue to be agitated until the whole of the iodide of cadmium is taken up; let it rest, after this, for twelve hours; it may then be decanted into another vessel.

Q. What are then the proportions of the collodion?

A. The collodion contains two-thirds ether, one-third alcohol; and, to 100 centimètre cubes of this mixture, 16 grains of gun-cotton, and 16 grains of iodide of cadmium, are to be added. This preparation will readily adapt itself to the glass plates, and may be spread without much difficulty. Sometimes it will be found necessary to add fluidity to the solution; and, for this purpose, another bottle should always be at hand containing the following mixture:—

Rectified sulphuric ether	90 c c.
Gun-cotton	2 scruples.
Alcohol	10 c. c.

A little of this preparation effectually clears the collodion, and renders it sufficiently fluid for all practical purposes.

Q. Describe another form of the preparation of collodion.

A. Collodion is sometimes prepared as follows:—

Rectified ether	67 c. c.
Gun-cotton	16 grains.
Alcohol	33 c. c.
Pure iodine	0·6 grains.

And a small quantity of laminated cadmium.

This mixture is to be agitated until the iodine is dissolved; it is then to be exposed to the light, and discoloration allowed to take place; after which, the clear portion of it may be decanted, and reserved for use.

Q. Are not other chemicals sometimes introduced in the preparation of collodion?

A. Some photographers employ soluble bromide of cadmium, ammonium, and potassium, so as to produce a sensitive coating of bromide of silver. The proportion of soluble bromide is generally about one-fourth of the iodide employed. Thus:—

Rectified ether	67 c. c.
Cotton	16 grains.
Alcohol	33 c. c.
Iodide of cadmium	16 grains.
Bromide of cadmium	4 grains.

The addition of the bromide is always useful for landscape or copying, but is not so suitable for taking portraits.

Q. Describe other processes.

A. The following, in which are united three iodides and three bromides, namely, potassium, ammonium, and cadmium, gives a collodion which will keep for a long time:—

Rectified ether	67 c. c.
Gun-cotton	16 grains.
Alcohol	33 c. c.

And

Iodide of potassium	4 grains.
Iodide of ammonium	6 grains.
Iodide of cadmium	6 grains.
Bromide of potassium	1 grain.
Bromide of ammonium	2 grains.
Bromide of cadmium	2 grains.

The iodides and bromides are to be mixed in a mortar of glazed earthenware, and, when properly prepared, they

* Cubic centimètre, 0 001,761 parts of a pint.

are to be added to the collodion; and, after having been thoroughly shaken, should be allowed to remain three or four days before using.

(*To be continued.*)

Correspondence.

TRANSPARENT ENAMEL PHOTOGRAPHS.

Sir,—In one of your replies to correspondents you express a desire to be furnished with information on the subject of transparent enamel photographs; so, without presuming to instruct one so experienced as yourself in photographic matters, I think I may venture to give you my experience on the subject.

Being daily engaged at Messrs. Horne and Thornthwaite's, I happened to be present when (in the earlier part of 1858) some opal glass plates were offered by Messrs. Chance, Brothers, of Birmingham; the gentlemen offering them could give no information as to their special application, "they were simply for taking photographs upon." The idea, however, immediately presented itself to my mind—that they might be judiciously applied to taking transparencies in imitation of the Swiss porcelain pictures.

I made a few experiments, which so completely convinced me of their suitableness for the purpose above mentioned that I resolved to construct an octagonal lamp, having sides about 8 × 3, with transparencies of such subjects as the Apollo, Belvidere, Canova's Terpsichore, &c., thereon; an argand burner would have shown these up to great advantage, and I should have sent them to the Photographic Exhibition. This *good intention*, however, I regret to state, has only gone to form another paving stone for a locality to which I am sure I need not more particularly allude.

The process is a very simple one:—It is only necessary to procure some opal-flashed glass plates of the desired size, coat with collodion, and sensitise in the usual way, and expose in a copying camera to a good negative; the resulting picture, developed also in the usual way for a negative, will, of course, be a positive, which has the advantage of being so either by reflected or transmitted light; the same result may also be obtained if the plates are prepared by any of the dry processes, and the negative simply obtained by superposition.

The photographs so obtained have a beauty peculiarly their own; the high lights being remarkable for a marble-like whiteness, and the deep shadows beautifully transparent. —I am, sir, yours, &c., James Martin.

122, *Newgate-street*, *London*, *27th December*, 1858.

DEVELOPMENT OF AN IMAGE AFTER FIXING.

Dear Sir,—In reference to Mr. Sidebotham's letter in vol. i. p. 173, "On the Development of an Image after Fixing," I may mention that some time ago I adopted the plan of *re*-development after fixing. In my early attempts with Fothergill's process I set aside some otherwise good negatives because they were too weak to print well; the simple fact was, that I had not carried the development far enough. Many weeks after I thought of and tried the plan of re-development, using a slightly weaker solution, and with complete success.

While on this subject I may add my testimony to the very practical nature of Fothergill's process. I have scarcely had a single failure, though I have often had to work under disadvantageous circumstances; and this is the thing to test the merits of a process.

In this process, although the prepared plate may appear almost as transparent as glass, any amount of opacity may be attained by carrying the development far enough.—Yours faithfully, Robt. W. Hall, F.L.S.

Photographic Societies.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

A meeting of this society was held at the Golf Club House, Blackheath, December 20, 1858, the president, J. Glaisher, Esq., in the chair. T. Knill and H. Williams, Esqrs., were duly elected members of the society.

Mr. Heisch, V.P., called the attention of the society to the use of metagelatine as a substance for mounting photographs. He stated that it was as strong and good as glue, and had this advantage, that it could be used cold, and dried sufficiently slowly to admit of its being spread upon the largest photograph with the utmost deliberation, which is not the case with glue and other kinds of gelatine, which require to be used hot. Pianoforte makers' glue, converted by sulphuric acid, answers very well, the slight colour being of no importance; for this purpose 1 oz. of glue would make 1 pint of solution. It is best prepared as follows: place 1 oz. of glue in 10 oz. of water to which have been added 40 minims of oil of vitriol, allow it to soak for some hours till the glue is completely swelled, then heat almost to boiling for 2 or 3 hours, saturate the acid with carbonate of lime (common whitening answers very well), and filter hot through coarse blanket paper; when filtered add 2 oz. spirit of wine, and make up the solution to 20 oz., it will now filter through the finest blotting paper at a temperature of about 80°, while at from 60 to 65° it is a very thick syrup, which when applied to paper does not soak in sufficiently to cause the warping of the board on which it was mounted. The solution will keep any time and is always ready for use. The heating of the glue with the acid must not be too prolonged, in fact a small quantity of gelatine must be left unconverted, otherwise the solution remains quite limpid at all temperatures.

Mr. Melhuish exhibited some stereograms he had recently received from F. Haes, Esq. The negatives were taken in intensely hot weather in Cairo, on plates prepared by Dr. Hill Norris before Mr. Haes' departure from England. Mr. Haes stated that the time of exposure was decidedly longer than would be required in England.

Mr. Knill exhibited some large photographs which he has recently brought from Rome, and Mr. James a very beautiful photograph from a drawing.

Miscellaneous.

Blue or Red Photographs.—M. Niépce has added a note to his paper, which we published recently, containing some important details relative to the more easy acquisition of blue or red photographic pictures, in which prussiate of potash is used as the developing agent. After the insolation of paper prepared with prussiate of potash under a negative, a boiling solution previously saturated with bichloride of mercury is then poured upon it, and the picture is allowed to remain in this for two or three minutes, and then rinsed in pure water; after which a boiling solution of quadroxalate of potash, previously saturated cold, is poured on it, when a fine blue colour will be developed with great rapidity, the proof must then be washed in pure water, and it is fixed. To obtain fine pure red tones, paper prepared with nitrate of uranium must be heated to a temperature of about 120 degrees before exposure to the light; its action in this case being more prompt on the prussiate of potash.

Third Exposition of the French Photographic Society.—The third Exposition of the French Photographic Society, announced for the month of February, is postponed until April, 1859. Consequently intending exhibitors should send their pictures (carriage paid) by the 15th March at latest, to M. Martin Laulerie, Secretary of the Society, Rue Drouot, 11; who will take charge of them, and forward them to the place selected for the exhibition. Wishing to give to this Exposition all the importance and interest possible, the society invites all photographers, native and foreign, to send pictures, in order to form an Exposition really universal, where the progress made by the art in each country may be appreciated. All works sent will be submitted to the examination of a special jury, who will decide as to their admission. This jury will be named at the next general meeting of the society, and the list published in the next number of the *Bulletin*, with the regulations of the Exposition.

Photographic Notes and Queries.

ILLUMINATED PAPER STEREOGRAMS.

SIR,—"P. H. O.'s" inquires in vol. i. p. 177, "What is the best way to procure the semi-transparent or illuminated stereo. slides on paper?"

Perhaps the following plan would be found useful:—Take a positive of the slide on wet collodion in the camera the same size as the negative; then, when dry and varnished, cover the positive with Archer's transferring varnish (gutta percha dissolved in benzole), warming the glass that the gutta percha may dry transparent. Then cut thin negative paper (avoiding the water mark) larger than the positive, and spread gum evenly over the paper. Then having placed the glass in water till the film is disengaged, turn it over, and let it float perfectly smooth on the surface of the water. Then take a bottle (with a cork in it), and, with a smooth surface (the bottle should be large enough to allow the positive to go round it, and leave a space between the two ends), place the bottle underneath the positive, so that when lifted up from the water it will be rolled quite smooth round the bottle. Then remove the moisture from the positive and the bottle with blotting paper, and carefully place one end of the positive on to the gummed paper, then, by slowly rolling the bottle with slight pressure, the positive will adhere to the paper without the chance of air bubbles, and will have the same side on the paper that was on the glass. The paper when dry, if not considered sufficiently transparent, may be varnished or waxed. The positive may also be coloured on the paper side with transparent colours. The paper must be cut so as to leave a narrow margin round the positive, which must be divided in the centre of the space between the two pictures, that each picture may have a margin round it. They should then be mounted, the left hand picture to the right of the other, on a skeleton mount, that is, the parts where the pictures are to be should be cut out the same size as the pictures, and they should be attached to the edges by gumming the paper margin.

The mount is necessary because the pictures would curl up unless fastened to something rigid. The mount should be rather thick.

I think these transparent collodion positives on paper would be superior to any printed on the paper and varnished or waxed.

Reigate. THOMAS BARRETT.

TONING BATH.

SIR,—The best toning bath I ever met with is composed of

Chloride of gold	1 grain.
Carbonate of soda	1 drachm.
Citric acid	20 grains.
Water	12 ounces.

Mix and warm till it slightly changes colour; use whilst warm.

The pictures are washed for a few minutes from free nitrate, and then put into the toning bath, care being taken as to bubbles, &c. They are fully toned in about half a minute, or even less. Afterwards they are washed and put into hypo., 4 ounces to a pint, and washed as usual.

Now I find this bath very slow when cold, or an hour or two old. A day old, it is quite useless, even when warmed up. Is there a remedy for this? or must it be thrown away, and a fresh bath made? Can gold be added to it with advantage? I find that this addition does *not* improve it in any way. S. S. B.

[The bath can only be used when freshly made, as the citrate of soda gradually re-acts on the chloride of gold, and reduces it, consequently a very little should be used at a time. A good plan will be to dissolve the chloride of gold in half of the water, and, the other substances in the remainder, and mix together, in equal proportions, just enough for present use.]

SELF-ACTING LEVELLING STAND.

DEAR SIR,—Will you suggest to the makers of photographic apparatus that they may supply a want (and, what is more to the purpose, put something in their own pockets) by making a self-acting levelling stand. I mean a triangle with three points as usual on which to support the plate, but resting on a pivot in the centre, and connected with a heavy bob underneath, not heavier, however, than is necessary. This might be done in the space occupied by an ordinary stand.

When working inside a carriage the usual stand is put out of level every time the horse shakes his head or wags his tail—which occurs every ten seconds in hot weather; and it is very provoking to find, when working a large plate, that all the pyrogallic is tilted over one corner before one has time to stop it.

Something of the kind was introduced two or three years ago, but it was for a different purpose, and was too clumsy ever to come much into use.—Yours truly,

W. R. SEDGFIELD.

STEREOSCOPIC CAMERA.

SIR,—I may take the opportunity to describe an impromptu stereoscopic camera, to the "invention" of which I was driven by necessity." Being desirous of taking some double pictures, and having nothing but the ordinary camera with me, it occurred to me that as my slide had no lateral motion, the only alternative was to put one to my lens. For this purpose I cut a slit in the front of my camera; overlapping this, and running in a groove, I placed a slide, in the centre of which I screwed my lens. It thus moved freely from side to side. By sawing through the centre of the sliding shutter of the camera, I was enabled to take both pictures alternately upon the same plate, shifting the lens right and left as required.

I would suggest that this arrangement might be advantageously applied to the ordinary stereoscopic camera. By its use but one lateral movement is required; thus doing away with the necessity of shifting-tables, or any other arrangement—except the twin lenses for taking double pictures.

Bayswater. H. T. T.

FOTHERGILL'S PROCESS.

SIR,—I am rather surprised at the statement of Mr. Nicol as to the wonderfully rapid pictures he has obtained by the above process, viz., with a 7-inch focus lens, $\frac{6}{16}$ stop, 40 seconds' exposure, 5 weeks old, &c. Now, I have tried with a very similar mixture of albumen—but, although it was beaten to a froth, it did not obtain a negative, with a 4½-inch focus lens, ¼ stop, in bright sunlight, in less than 3 minutes; and several friends have found even 9 minutes not too long. Perhaps it may be urged that my collodion must be slow. I think not: 10 seconds will be sufficient time with the above stop to get a good negative. So I fancy Mr. Nicol must have made a mistake; for the collodion I use is nearly similar in ingredients to that mentioned by him, with this difference in my favour—I use 5 ether, alcohol 3, which increases the rapidity by 1, making the collodion more powdery. ONE OF DEVON.

VIGNETTE GLASS.

SIR,—* * * * asks for a simple method of making a vignette glass. The only one of any real value is that of taking a mat of the required shape, and laying it on to a piece of cardboard the size of the printing frame; cut out the cardboard to the shape of the mat, place the negative and paper in the frame as usual, then on the glass of the frame (outside) affix the cardboard, placing the hole over the portrait, first placing a little cotton wool round the edge of the hole; affix cardboard to the frame by pins, &c.

W. H. W.

TO CONVERT A POSITIVE INTO A NEGATIVE.

Sir,—Perhaps the following will be worth the attention of some of your readers:—To turn a *positive* into a *negative*, prepare the plate, and expose as for a *positive*; develop with photosulphate of iron, and wash clean; again pour over the plate some *pyrogallic acid developing solution*; wash, &c. as for a *negative*, which you will see you have got.

C. F. B.

SYNOPSIS OF PHOTOGRAPHIC PROCESSES.—WET COLLODION POSITIVES.

Clean plates.
Coat with collodion.
Immerse in bath in same way as negative.
Place in slide.
Expose.
Develop (3″ to 10″).
Wash directly.
Fix.
Wash well.
Dry.
Varnish.

Developing solution:—

Protosulphate of iron	12 grains.
Acetic acid	15 minims.
Alcohol	10 ,,
Water	1 ounce.

4 drachms for a plate of 20 square inches.

Fixing solution:—

Cyanide of potassium	10 grains.
Water	1 ounce.

H. S. I.

WHAT TO AVOID IN PHOTOGRAPHY.

Do not believe all that inventors state about the perfection of their processes.

Do not store sensitive dry plates in deal boxes.

Do not allow the distance between the sitter and camera to be less than 6 feet.

Do not tilt the camera upwards, but always keep it horizontal.

Do not plant the legs of the camera-stand too close together.

Do not fix collodion negatives with cyanide of potassium, in preference to hyposulphite of soda.

ANSWERS TO MINOR QUERIES.

Transparent Glass Stereograms.—*Millet.* Very excellent transparent glass stereograms have been taken by us in the following way some years ago:—Coat a glass plate with collodion uniodised, but containing the same quantity of alcohol as if the iodising solution had been added to it. When it has set, immerse in a dish of clean water, and after allowing it to remain there for five or ten minutes, remove it; and after washing it slightly in fresh water, rest it against a wall, on blotting paper, to drain. After the plates have drained for a few minutes, but are still wet on the surface, pour over once or twice the following mixture:—

Albumen	10 ounces.
Common salt	100 grains.

(This must have been previously beaten up to a froth, allowed to settle, and then filtered.) Then rest them up against a wall, on blotting paper, to dry: they will keep in a dry place for months. When required to be used, dip into a bath containing 30 grains of nitrate of silver to the ounce of water, drain, and dry in the dark. Expose under a negative in a pressure frame to the full rays of the sun until strongly printed; proceed in the subsequent operations as if the picture were an albumenised paper positive, employing the same toning and fixing baths.

Saturated Solution of Gallic Acid.—*R. T. P.* Your solution of gallic acid has not been anything like saturated, if prepared merely by placing an excess of gallic acid in water, shaking up for five minutes, and then filtering. The way you must do is to place about half an ounce into a stoppered bottle, holding about a quart, and then to completely fill it with distilled water. Prepare it, if possible, some days before requiring to use it, shaking it up now and then; by the end of this time it will be really a saturated solution, and will have great developing energy in the calotype process. When required for use, filter off as much as is wanted, and fill up the bottle with fresh water. It will be as well, also, in order to guard against the ingress of air, to let the bottle stand upside down, resting on the stopper, in a corner. It will thus keep good for months.

To Dry Gun-cotton rapidly.—*Pyro.* Do not attempt to dry your gun-cotton rapidly before a fire, but proceed in the following way:—After washing, place it in the folds of a clean cloth, and wring it out as dry as possible; then place the cotton in alcohol, loosen the fibres by stirring with a glass rod; then take it out, press the alcohol from it, wring it out as dry as possible in a cloth, and pick it quite loose, in a few minutes it will be quite dry. An enterprising American has taken out a patent for the above.

TO CORRESPONDENTS.

☞ Some complaints having been made by our subscribers as to the non-receipt of the "Photographic News," the publishers beg respectfully to notify that every care is taken on their part to insure punctual and correct dispatch. All complaints should, therefore, be made to the Post Office authorities.

Norma.—If you use fused nitrate of silver, it should be faintly acidulated with acetic acid. Good crystallised nitrate will, however, do very well for positive printing. We have had no experience in the "new process" mentioned by our contemporary. The paper you allude to is very good, but we do not know what are its special advantages.

H. S. I.—1. Your best plan for obtaining reduced photographs of maps, &c., will be to use wet collodion; a single lens, stopped down by means of a ½-inch diaphragm in front of it; and to have the sun shining on to the map. 2. Water colours; but only those which dry transparent. 3. One part of hydrochloric acid and four of water, rubbed on with finely powdered bath brick and a piece of flannel; when bright, wash with plenty of water.

Y. Z.—Marine glue is the best cement we know of for fastening glass. Perhaps some correspondents would favour us with their experience on this point, as ours has been rather limited?

B. D.—Your best plan will be to consult some photographic friend who will take the trouble to test your bath. With the slight knowledge of photography which you possess, you have acted rashly in adding so many chemicals to your bath; still, we would not advise you to discard it until some experienced hand has tried whether it cannot be brought again into working order.

W. A. M.—The law of artistic copyright is at present in a very vague state, but we are decidedly of opinion that, were you to sell photographic impressions of copyright engravings, you would render yourself liable to legal proceedings for infringement of copyright.

G. W. H.—With ordinary caution the vapour of chloroform, which would be inhaled whilst using it to take off the black varnish from a glass positive, would not be injurious.

A. Bremenium.—The effect you mention is produced by *hot pressing*, this you can have done for you by sending the pictures to a wholesale stationer or copper-plate printer. We prefer starch paste for mounting stereograms. Your first production is very creditable.

S. Taylor.—We hope soon to be able to give some further information on the subject of your letter.

Iron has a large quantity of pure protosulphate of iron which he wishes to dispose of. He had better apply to one of the photographic chemists whose addresses will be found in our advertising pages.

J. Paterson.—All that is known of importance respecting the employment of nitrate of uranium for photographic purposes will be found in the "Photographic News." We do not think the print you mention was taken by its means.

A. Burton.—Your first question has been already answered in full. Would it not be as well to *try* if your bath be injured before asking for a remedy?

H. & J.—Filter the bath and add a few drops of acetic acid.

G. H.—An ordinary unachromatic glass similar to a spectacle lens is what is referred to. The telescope described has no pretensions to merit beyond cheapness.

Communications declined with thanks:—J. M.—F. W. W.—G. A. H.—Hawker.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—E. C. B.—W. H.—J. M.—F. B.—Alice.—An Old Stager.—B. O. O.—Xmas.—T. N.—P. A. L.—X. Y. Z.—W. C.

In Type:—J. T.—Norma.—H. C. J.—T. W.—Viator.—An Amateur.—Gwenthilian.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Cassell, Petter, and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., NO. 18.—*January 7, 1859.*

SUGGESTIONS FOR THE EMPLOYMENT OF GELATINE PAPER IN PHOTOGRAPHY.

Now that attention is being drawn in the photographic world to the employment of other transparent media than glass for the purpose of acting as a support for the collodion film, we would draw attention to the substance known in commerce as gelatine paper, as possessing qualities of transparency, flexibility, and toughness, which cannot fail to recommend it to all photographers. Its general employment was suggested by H. Dobell, Esq., in a paper communicated to the Royal Society, and it is from the proceedings of that body that we have made the following extracts. The author has pointed out several very useful applications of this substance, but has omitted all remarks as to its applicability to photography; its employment, however, in the various branches of our art is so obvious that it would be superfluous for us to do more than mention its many good qualities to our readers.

The object of the communication is threefold:—

1. To point out the properties of a material called gelatine paper, which render it applicable as a medium for colouring light.

2. Through the means of gelatine paper to introduce the use of coloured light in the arts for the preservation of the sight of artisans.

3. To introduce the use of gelatine paper for the relief of persons suffering from impaired vision; for the preservation of the sight of travellers, and of all those who are much engaged in reading.

This material was invented in 1829 by the late M. Grenet, of Rouen, and was exhibited by him in its present state of perfection in the Great Exhibition of 1851. But up to the present time it has not been successfully applied to any more useful purposes than the manufacture of artificial flowers, address-cards, tracing paper, wafers, wrappers of confectionery, and the like.

It is commonly manufactured in sheets, measuring 22 inches in length, and 16 inches in diameter, which are sold at a low price; but the sheets can as easily be made of any dimensions not exceeding those of which plate-glass is capable. It can be made of any thickness, from that of the finest tissue paper upwards. It may be obtained as transparent as the best glass, and more free from colour, or from all colours and shades of colour, without interfering with its transparency. It is exceedingly light, and may be bent or rolled up without injury. It can be cut with scissors like ordinary paper, and may easily be stitched with a needle and thread. By means of an aqueous solution of gelatine, it can be made to adhere accurately to plates of glass without any interference with its transparency. When varnished with collodion it becomes perfectly waterproof, more pliable, capable of bearing a considerable degree of heat without injury, and its transparency is not affected. Such being the properties of the material, the following are enumerated by the author as some of the forms in which he suggests that it may be employed, and in which it has already been found useful.

1. A small sheet of very pale green or blue gelatine paper, to be used in reading. The sheet is simply to be laid upon the page of the book, and the reading to be conducted through the coloured medium. If used in a faint light, the reading paper is to be removed a little from the book to admit more light beneath it.

2. A sheet of gelatine paper of pale green set in a light frame, and placed like a screen before the window or lamp of the engraver, the watchmaker, the jeweller, and the like; thus providing a light of genial colour, in which they may pursue their occupations.

3. A similar appliance to the last mentioned for the use of needlewomen. For this purpose screens are to be provided, both of green and of blue gelatine paper, so that the white materials employed in needlework may be changed into a pleasant green by the screen of that colour, the yellow materials to a green by the blue screen, and by one or other of these screens the reds softened down into violets or browns.

4. For either of the last two purposes on a larger scale, the gelatine paper may be attached to the window glass of the apartment, thus colouring, if necessary, all the light admitted during the day-time.

5. Shades for the eyes in certain affections of the sight, to take the place of the green or blue silk and card shades worn by many persons. The gelatine paper, being transparent, will allow the wearer to see his way about, at the same time that the eyes are protected from a glaring light. This may be especially useful in cases where it is desired not only to shade a diseased eye, but also to protect its nerves from strong light admitted by the sound eye. When not only coloured light but a certain degree of darkness is required, this can be readily and delicately graduated by employing shades of different depths of colour.

6. Masks of gelatine paper, for protecting the eyes of travellers against the glare of snow-fields and of sandy deserts.

GENERAL OBSERVATIONS ON PHOTOGRAPHIC POSITIVE PROOFS.*

BY MM. DAVANNE AND A. GIRARD.

ON SENSITISING—(*continued*).

Of the Influence of the Strength of the Bath—(*continued*).—We will first occupy ourselves with the cause to which the clearness and vigour are owing. In this case we are assisted by chemical analysis, which gives us the key of the phenomenon. If, in fact, we prepare a sheet of paper in a solution containing 5 per cent. of common salt, and afterwards cut it into three parts, and place one on a bath composed of 8 per cent. of nitrate of silver, another on a bath of 12 per cent., and the third on a bath of 18 per cent., we see at once, when converted into positives, the verification of what we have announced on the subject of clearness and colouring. If we estimate the quantity of silver fixed by papers prepared in the manner we have pointed out, we see that, for a given paper,† each sheet prepared on the bath

At 18 per cent. contains ..	... 0·876	of metallic silver
At 12 per cent. contains ...	... 0·683	„
At 8 per cent. contains ...	... 0·467	„

Hence it follows that the proof is clear and vigorous in proportion to the quantity of silver it contains. Now, if we consider that these three pieces of paper were salted in an identical manner, that each of them consequently contained

* Continued from p. 196.

† We consider it necessary to remind our readers, that a bath of a given richness may give different results with papers of different porosity, *the absorption of the salt being in proportion to the porosity.*

a like quantity of chloride of sodium, that this cannot exist in a free state in the presence of an excess of nitrate of silver, and that, consequently, each of them contained a like quantity of chloride of silver, it will be evident that the differences in richness of silver, which are alone pointed out, are due to the differences in the quantity of nitrate in excess, as not only was this the sole point of difference in the conditions under which the operations were conducted, but it also seems more natural to ascribe to the nitrate of silver the differences observed in the result.

It is easy to verify the influence which an excess of nitrate of silver exercises on the value of a proof. Take a sheet of paper, and, after salting and sensitising it in the ordinary manner, divide it into two parts; wash one of the halves in several quantities of distilled water, so as to remove from it all the excess of free nitrate of silver, while the other is left just as it has been prepared; then expose the two halves under the same negative, and great differences will at once be observed. The first half, which contains nothing but chloride of silver, will be acted upon more quickly than the second, it will rapidly attain a violet-gray tint; but this point once attained, it does not go beyond it, and the proof will be finally dull, uniform, and without colour.

The second half will make slower progress at first, but once begun it will proceed rapidly enough; the blacks will mount in tone, while the whites will be well preserved, and, finally, an ordinary proof will be obtained.

The influence exercised, therefore, by the free nitrate of silver is evident; but after demonstrating its existence, and establishing its rôle, an important point remains to be cleared up, viz., the explanation of this rôle. To arrive at this, we ground our observations on two points:—

1. The presence of free nitrate of silver diminishes the sensibility of the chloride. That is a fact which experiment has proved to us, and a fact that every one may easily verify, by precipitating in two glasses a certain quantity of salted solution by an excess of nitrate of silver, washing one of the precipitates by decantation, and exposing both of them to solar light, the one containing chloride in suspension in water, the other containing chloride in suspension in a solution of nitrate. It will be then seen that the first colours more rapidly than the second.

2. When a sheet of paper impregnated with a film of chloride of silver mixed with free nitrate is exposed to the light, the chloride at its surface first blackens by reduction, but this chemical reaction liberates a certain quantity of chlorine in such a way that, by successive planes, a series of films of chloride of silver are formed, and it is to this continued reduction of these successive films that a greater intensity of colouring is, in part at least, due.

Beside this, in albumenised papers especially, a combination intervenes between the nitrate in excess and the organic matter: in albumen it is insoluble, as everybody knows; and if hitherto this fact has not been taken sufficiently into consideration, it exercises a no less important effect on the photographic result, to which we shall refer hereafter.

This theory, which we have reason to believe exact, and which we content ourselves at present by enunciating, we reserve for future consideration and proof, when in the next number we consider the subject of insolation—this theory, we say, joined to the first observation that we have made, assists in explaining the action of nitrate of silver in excess.

In fact, since the chloride of silver is more impressionable when it is insolated, it will be conceived that its reduction is effected more quickly; also that a light, even very feeble, suffices to attack it, and that consequently the whites tint themselves. When the colouring has reached a certain point, the surface is coated with a coloured film that the light has a difficulty in traversing; but for that the proof would increase in tone—equally everywhere, it is true, still it would increase in tone. In the laboratories this fact is verified every day: on abandoning to the light a sufficiently abundant precipitate of chloride of silver, its surface colours by reduction; but however prolonged the action may be, it is only necessary to raise the very thin film to find the subjacent part perfectly white and intact.

(To be continued.)

THE PHOTOGEN.

WE confess to having felt a slight degree of prejudice against this invention, arising out of experiments made long since with some of the "Photogenic composition;" but the importance of having a light which should render night photography not only possible, but easy, induced us to visit the Polytechnic Institution with a view to ascertain if the flattering opinions which had been given of the new light in the daily press were well founded.

The claims put forward in favour of "The Photogen" are many. It is the only invention by means of which portraits can be obtained at night equal to those obtained by daylight,—for there appears to be no doubt that the French and American inventions are failures; the compositions hitherto tried in this country, and the electric light, are objectionable for obvious reasons. The apparatus is simple in its construction; it is in shape like a large glass lantern, in the bottom of which holes are contrived for the purpose of admitting air in such a manner as to surround the burning composition in the crucible, and carry off the vapour generated through a pipe at the top of the apparatus, into a chimney or some other convenient outlet. It is inexpensive in its working, the cost of taking the largest sized portraits being about twopence; "while for delicacy of shade, strength, and tone, the pictures are equal to the finest day specimens." Indeed, the inventor states, that on dull days he invites ladies and gentlemen who call upon him to have their portraits taken, to return in the evening, in order that they may be taken by means of his artificial light. It will be seen, therefore, that if all that is stated with respect to this light be true, there is hardly anything wanting to render it perfect; and we are bound to say that, having seen portraits produced by this light under circumstances more favourable than exist at the Polytechnic Institution, this perfection is very nearly attained. We have before us portraits taken by the Photogenic Light, which, as regards delicacy of finish and graduations of tone, are nearly equal to the very best pictures taken by daylight, under the most favourable circumstances, that we have ever seen; and superior to portraits taken by daylight under circumstances less auspicious.

The manipulations in no respect differ from those employed in taking portraits by daylight; and the process has the additional advantage of being certain in its operation; in fact, in no instance did we observe a failure in the experiments made in our presence. The time of exposure in the camera is regulated by the time occupied in the combustion of the composition—thus the risk of over or under exposure is avoided, and the sitter is not annoyed by having to sit a second time—a matter of some importance, as many people are somewhat nervous on undergoing the operations of "having their likeness taken," and, in such a case, the second attempt is not likely to be more successful in producing a good portrait than the first. The rapidity of the action of this light is surprising when it is remembered that it is artificial, fifteen seconds, and even less, being all that is required for the purpose.

In conclusion, we may remark that, however agreeable it may be to visit the Polytechnic Institution—and its attractions are great, if we may judge from the thousands who were present on the night when we visited it—it is not the best place for photographers to examine *minutely* the merits of "The Photogen;" its capabilities as an illuminating agent may, however, be seen to better advantage there than elsewhere.

We had almost forgotten to mention that the eyes of the

sitter are in no way dazzled by the brilliancy of the light; this being obviated by the intervention of a blue glass and fan, which intercept a great part of the light, while they allow the greater portion of the actinic rays to pass through.

THE MOLECULAR ACTION OF CRYSTALLINE PARTICLES.*

BY DR. A. WELLER.

THE immersion of a piece of bread in champagne, to renew the effervescence, is merely an example of the contact of a fresh surface with the gas: in a short time it ceases to have this effect; but if a fresh piece of bread is used, the effervescence is renewed as before. The difference of effect between this and a piece of metal arises from the superior extent of surfaces presented by the cavities of the bread. The disengagement of steam from boiling water by platinum foil or any other solid substance, is likewise of the same nature. After a very short time this effect ceases, unless renewed by a fresh surface. The most natural explanation of these phenomena is to refer them to some molecular action of the solid upon gas, probably of a mechanical nature, which lasts a very short time, when the solid acquires a *droit de domicile* in the liquid, and becomes perfectly inert. M. Legrand, who has made some correct experiments on the point of ebullition of saline solutions, remarks, that platinum possesses no power in equalizing ebullition after a few moments, when, according to him, all the air has been expelled from its surface; but, on the contrary, zinc and iron will act as long as they are present in the liquid, which he attributes to their power of decomposing water.

Previously to showing the existence of the same action in bodies in a state of vapour, I will make a short digression with respect to the constitution of vapours in general. The term vapour is commonly applied to bodies in three different conditions. 1st. That of temporary gas diffused in the atmosphere. 2nd. That of liquid particles mechanically suspended there. 3rd. That of solid particles suspended in like manner. To the two latter, to speak more correctly, may be applied the term of *fumes;* the first corresponds to the solution in a liquid, and the others to that of suspension in the same. As examples of the first we have the vapours of water while in an invisible state, and those of bromine, &c.; of the second, water as in mists, fogs, &c.; and of the third, the vapours of arsenic and of corrosive sublimate. Bodies in either of these conditions possess the faculty of assuming a definite crystalline form on becoming solid. The properties of the gaseous vapours are so well known, that it is unnecessary to dwell upon them here. The second class of liquid globular vapours or fumes, which, as we have said, cause those accumulations known under the name of fogs, clouds, or mists, are those which I intend at present to examine, as they comprehend the theory of fixation of the mercurial vapours in the daguerreotype. It was formerly believed that vapour or mist was composed of minute spherules or globules of liquid water, and in Newton's works we find evidence that such was his opinion. According to another view, first advanced, I believe, by De Saussure, these vapours were composed of vesicles or very minute bubbles, exactly resembling, on a small scale, the common soap bubble: this opinion has received the assent of Fresnel and Berzelius, and at present obtains general credence. The proofs on which it is considered to be founded are principally the observations of De Saussure, who asserts that on high mountains, or in the clouds, he has been able to detect these air vesicles with the naked eye, and has seen them burst as they came in contact with each other. Berzelius recommends the examination of the vapour of water over a dark surface, such as that of ink, with a lens of a short focus. He says that vesicles may be detected in this manner, varying in size from $\frac{1}{4500}$th to $\frac{1}{2780}$th of an inch, which occasionally burst as they touch each other. The suspension of clouds is also used as an argument in favour of the vesicular theory, as it is contended that liquid spherules would descend to the ground by their specific gravity in such situations: Fresnel, indeed, compares the globules to small balloons, which dilate or contract, according to the temperature of the air they contain.

(To be continued.)

* Continued from page 198.

Critical Notices.

EXHIBITION OF THE ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.*

THE inspection of the views by Cade has given us much pleasure. These views are small compared with those we have already noticed, but they are exquisitely fine in tone and detail. "The Fitzwilliam Museum, Cambridge" (157) is very clear in tone, and the perspective is very effective; even the ornamentation at the side of the picture is clear and distinct. "Corpus Christi College, Cambridge" (158), is not as equal in tone as the former. The body of the picture is too dark, while the turrets at the top of the building are too white. "Sir Isaac Newton's Tower, Trinity College" (159), has many of the characteristics of a good photograph; in it we see great equality of tone, and the tint, which is of a grayish colour, adds much to the effect. In the photograph of "St. John's College, New Buildings, Cambridge" (161), there is a particular softness, combined with minute microscopic detail. In this picture there is greater perfection than in any one of the series, and it is particularly free from spots and defects. "Interior—Trinity Library" (178), is a good photograph of a difficult subject. It will be seen that a very strong light was shining through the windows when the photograph was being taken. This does much to spoil the effect of a picture, as intense light always destroys effect. The ceiling is very finely given. "Walberswich Church, Suffolk" (179), is a well executed photograph, and has much more foreground detail than many of Mr. Cade's pictures. Altogether these views by Mr. Cade do him great credit, and we hope to see some more by the same artist in future exhibitions. The brilliant and beautiful photographs by Frith of Egyptian scenery are already so well known to the majority of our readers, that it would be superfluous on our part to criticise them at any great length. They possessed such merit, and received such well deserved encomiums, that it is almost matter of surprise that any one should have attempted to photograph Cairo so soon after Frith had done it. However, we have here a series of views of Cairo by Robertson and Beato, not so large, nor yet so beautiful, as those of Frith. We do not intend going into detail; suffice it to say, that they have all the characteristics and peculiarities of oriental photographs. Many of the views are extremely interesting, among which we may mention the "Tomb of the Mamelukes" (198), and the "Tombs of the Mamelukes and Caliphs" (203). In many of the photographs there is great nicety of detail, and generally the sites are well selected.

The next series are the old Spanish views by Lousada. We are astonished to see these photographs here, since, apart from the interest attaching to those views themselves, there is nothing to recommend them as photographs, and they are very bad as architectural studies; for instance, in some of the architectural views illustrated there is really a great deal of fine detail, but in the photographs by Lousada there is nothing but masses of black and white, with no half-tone. A few Oxford views by Cocke are very mediocre indeed. They will not bear the slightest comparison with Cade's Cambridge views; or even with any of the Oxford views we have seen. They have some few good points, but are generally too dark. We cannot say much of the selection of the site for the "Bird's-eye view of Westminster Abbey" (258); if we are to judge of the artist's ideas by the results, we can only say that he has attempted to take, in addition to the bird's-eye view of the Abbey, as many of the intervening chimneys as could be got into the picture. Baldus's Paris views are certainly the worst we have ever seen executed by this artist. They are not clear in tone, nor interesting in

* Concluded from page 199.

subject. He has introduced into one an artificial sky, which we do not like. Indeed, we are surprised to find that a photographer, who has earned such well-deserved laurels as M. Baldus, has allowed such very bad pictures to leave his studio.

Taking the photographs as they are catalogued, we next come to the Egyptian views by Frith; of these there can not be two opinions—they have deservedly established the reputation of Mr. Frith as a first-class photographer. Of the English views by the same artist, we cannot speak so highly. There is, if we may use the term, a decided mannerism in them. They are treated exactly in the same way as the Egyptian views: each photograph having a great intensity of black and white, and looking as though they had been taken under a scorching Eastern sun. This is a fault which is rendered more strikingly apparent by the contrast it offers to the Egyptian views. In the Eastern views there is much detail, while, in the English views, foliage is rendered in black masses. The view of "Inverness" (308*) is a most faulty picture; it is full of spots, and is altogether a very bad photograph. The water in the foreground is especially bad, while the stones in the bed of the river appear much as though spots of soot had accidentally fallen on the negative. There is an exquisite little view here by Cade, of the "Terrace at Sir William Middleton's," which we are inclined to think far surpasses any of those pictures already noticed. The views by Gutch, the "Exterior and Interior of Holyrood Chapel" (311F, 311G), are not equal to some we have seen by this artist.

Since the exhibition of the photographs of the Royal Engineers at South Kensington, we are not enabled to perceive any advance in the manipulation of these military photographers, if the "Rochester New Bridge," and the "Rochester Cathedral" (311H, 311K), are to be taken as specimens of progress.

And now we come to the most charming series of pictures in the collection. When we say they are executed by Bedford, need we say more? There are twelve views which have been "taken expressly for the association." We cannot help thinking that, when the association obtained Mr. Bedford's services, they ought at least to have asked him to have chosen some other subject than "Tintern Abbey." We have had this splendid ruin *ad nauseam*. The only thing that makes the present views at all bearable, is the astonishing perfection in which they are rendered. When we compare the views by Cocke with those by Mr. Bedford, we are then enabled to judge how far Mr. Bedford can surpass all other photographers in his execution. In no piece is this so perceptible as in the "View of the Choir looking East" (312), and in the same view by Cocke. In the one there is clearness of tone, detail in the foliage, and a beautiful perspective half tint as seen through the window of the Abbey; the foliage in the background is given with the greatest nicety: while in the other we have few or none of the characteristics of Bedford's photographs, and the foliage as seen through the window is only discernible in small patches. "The West Door, Tintern Abbey" (321), is a marvellously clear photograph; even the large nails in the door are easily discernible. But decidedly the best views are "The Donjon, Raglan Castle" (315); "The Entrance Gate, Raglan Castle" (317). In these we can see almost the form of every leaf, clear without even the aid of a glass; all the foliage is crisp, and every sprig of the delicate tendrils of the creeper as it reaches upward, looks as though it were a copy of some finely pencilled picture; indeed, the mass of foliage seems almost to invite one to put one's hand among the leaves. We confess we are at a loss to do full justice to these inimitable photographs. By the aid of a magnifying glass the detail of the grass could be almost seen. No photographer who exhibits in the present collection can compare with Bedford for the clearness of his foregrounds; whilst the lens with which these views were taken must be as near perfection as human skill could make it. There is a number of photographs here by Mr. Bedford which were exhibited in 1857. They are beautiful, but when we compare them with the new pictures, they show how decided are the marks of progress in Mr. Bedford's manipulative skill. The most beautiful of the old series is the celebrated "Baptistry of Canterbury Cathedral" (340), which attracted so much attention when first exhibited.

Of the Italian views by Ponti we are not able to say much. They lack what is needful to make them good photographs. There is a fault in them which seems to be prevalent in the pictures exhibited in this collection—too much black and white, and a want of half-tone. Some have many good points, but generally speaking, they are not such as to merit a long notice.

In conclusion we can only remark, that we think it would be almost desirable to introduce stereoscopic views as a part of the exhibition. One of the leading objects of the association is "to form a collection of photographs for the association; and, if thought desirable, to exhibit them;" and, of course, to distribute them to subscribers. There are many persons who would gladly subscribe, if among the photographs there were some good stereoscopic slides—such, for instance, as those by Sedgefield, which we recently had occasion to notice.

Lessons on Colouring Photographs.

COLOURING POSITIVES ON GLASS—(*continued.*)

Backgrounds.—The importance of a judiciously-managed background cannot be too highly estimated, and for want of care and judgment in this matter, many otherwise fine pictures are spoiled. It is stated that Sir Joshua Reynolds so highly appreciated the importance of the subject, that, although he frequently entrusted the filling-in of portions of his pictures to pupils, he never trusted a background to any pencil but his own. The primary object should be to give relief and prominence to the figure; but, in addition to this, a background frequently serves to connect and harmonise the whole colouring of the picture. A glass positive, with a clean untouched background, may sometimes be left uncoloured, and present a simple, unpretending effect; but it will have the disadvantage arising out of the tendency, well known to painters, which a flat plane of any uniform colour, especially if light and warm in tone, has to advance and obtrude itself upon the eye, and cause a want of atmosphere in the picture.

The natural tint of the background in the photograph is of some importance to the colorist, as, without a suitable ground to work upon, it is difficult to produce a satisfactory effect in colouring. By all means avoid white, especially the dull tawny white so often seen in common glass pictures. The best relief is given to the figure when the background is darker than the lights, but not so dark as the deepest shadows of the picture. A white background affords no relief or contrast to the face, and is, moreover, unsuitable for good effects in colouring. A very dark background is also difficult to colour, and by its depth impoverishes the shadows of the face. The best background for all effects in colouring is a gray, moderately dark. This is most easily produced by placing behind the sitter a screen covered with common sheeting calico, coloured in distemper with a mixture of black and white, forming a gray of about the tint desired in the photograph. To obtain the light behind the head, so much desiderated by some photographers, the screen should be painted and "flatted," using a similar gray, which on the required part of the background should gradually merge into white. To produce good results, this should be done by a painter.

In colouring the background, the colorist must be guided, primarily, in the selection of tints, by the complexion of the sitter, and then by the colour of the draperies. Of the general principles which regulate harmonious colouring, we shall, as we have said, speak hereafter. We may here briefly indicate that the effect of greens is to increase the rosy hue of the complexion; of violets and blues, to give it a somewhat yellow tinge; grays suit almost every complexion. Positive colours should be avoided in a background; the more neutral the tints, the more they will add to the quietness and repose which is desirable. A uniform tint of any colour should be avoided, as that gives to the figure an inlaid effect. Atmosphere is best obtained by the use of broken tints, and the judicious management of light and shadow on the background, arranging it so that the light

falls on the background from the same direction as on the sitter.

We have made no reference to any first colouring of the background, for this reason—in it is not required either the brilliancy of colour, or the solid effect, desirable in the more prominent parts of the picture; we think, therefore, one colouring, and that after varnishing, produces generally the best results. Under some circumstances this method may with advantage be modified, and in this respect experience must guide.

The colorist may use either background colours already mixed to the required tints by the manufacturer, or he may mix the different tints as occasion may require. As to the method of proceeding, one illustration will suffice: Suppose the background to be coloured is desired of a greenish gray. The figure is quartered a little from the light, so that the retiring portion is in shadow; the strongest light in the picture is on the head and face, and the chief light in the background is behind the head. Commence here with a mixture of silver gray and green, working round the head, carefully avoiding the hair, especially where it joins the background in light feathery locks. This light tint must gradually merge into a mixture of deeper gray and green as it approaches the shadowed part of the background; in the deepest shadow, towards the lower part of the picture, a little purple may be added to the mixture of dark gray and green. Around the outlines of the figure a pencil moderately small must be used, to enable the colorist to cover the background clean up to figure without impinging upon it; for the large plain surface a large soft pencil must be used, blending the whole as smoothly as possible.

Such a background as we have described has an exceedingly good effect, and to our taste is much superior to those in which a number of unmeaning objects, as columns, curtains, vases, &c. are suffered to obtrude. By some photographers, and many of the public, landscape backgrounds are much admired. If well managed, they have often a good effect. We shall treat of them next week.

(To be continued.)

Photographic Chemistry.

ORGANIC CHEMISTRY—(*continued*).

AMONG other substances which we obtain from vegetables are *gums*, most of which bear a striking resemblance in their composition to starch. They are generally soluble in water, though not capable of crystallising. Gums are of different kinds, and very numerous, but it is not necessary that we should enumerate them. As we have already stated, alcohol $C_4 H_6 O_2$, is formed from sizings by fermentation. It is a neutral substance, liquid, inflammable, and volatile, and is a *solvent* of many oily or resinous bodies—dissolving or assisting in the solution of various re-agents which are insoluble in water; such as gun-cotton, for example, which is used in the preparation of collodion. It coagulates albumen, and is employed in throwing down certain salts from their aqueous solutions, which, as we stated in a previous part of these papers, can thus be obtained in a state of great purity. This method of obtaining salts is usually adopted in the case of the double hyposulphite of soda and gold. There are bodies analogous to these in chemistry, but they are rarely employed by photographers. Alcohol may be said to form the starting point of a rather numerous series of chemical products, some of which are extensively used as solvents; as, for instance, sulphuric ether and acetic ether. There is also another body analogous to these—aldehyde—which is a powerful agent for the reduction of salts of silver, although it is not used much at present. The greater number of these compounds resemble each other in being liquid, volatile, and inflammable; and we need scarcely remark, that very great precaution is necessary in using these substances in a room where a light is burning.

Certain vegetable productions, when submitted to distillation in the presence of water, yield a more or less odorous and volatile oil, which is termed an *essence* or *essential oil*. These essences are of different kinds, according to the vegetable from which they are distilled, but all differ from the fatty or common oils. Suppose we let a single drop of one of these freshly-prepared essences fall on a sheet of paper, a spot will result resembling in appearance one caused by a fatty oil; but after a few seconds this will gradually disappear—in this respect differing from a fixed oil, which would have remained until removed by artificial means. Essential oils gradually absorb oxygen from the atmosphere, and after some time change from being fluid, at ordinary temperatures, to solid, and are, in fact, converted into a resin. In general, essences have the property of dissolving fatty bodies, and they have been, therefore, sometimes employed in heliographic processes.

The various products that are termed *resins* are, for the most part, soluble in ether, alcohol, and essential oils, and insoluble in water, and their principal use is in the composition of varnishes. The experiments of M. Nicephore Niepce, as well as those of his nephew and others, show that certain of these resins possess the singular property of being acted upon by the light in such a manner as to render them insoluble in essential oils or ethers, which were previously capable of dissolving them. The discovery of this property in the case of the bitumen of Judea, by the elder Niepce, led to the employment of other resins in the various processes of chemical engraving and photo-lithography.

We include, under the name of *fatty substances*, the fixed oils, butter, the different greases, and the fatty acids which are derived from them, such as margaric and stearic acids, which are employed in the manufacture of candles, &c. Fatty oils are of two natures; some of them thicken and harden on contact with the oxygen of the atmosphere, and these are termed *drying oils;* others do not thicken and dry, and among them may be included the oil of olives and sweet almonds. There are a large number of these fatty bodies, but it is not necessary that we should enter into a description of them here; suffice it to say, that they are employed extensively in the manufacture of the various kinds of soap.

(To be continued.)

Dictionary of Photography.

ALBUMEN (*continued*).—Pure albumen is said to have a faint acid reaction. As stated above, the coagulation of albumen commences at 140°. If the albumen be undiluted, as in the white of an egg, it solidifies into a white gelatinous mass, and it appears to coagulate with the more difficulty in proportion to the quantity of water with which it is mixed. When very dilute the solution merely becomes thick and turbid, but on ebullition it collects together in flakes, which then may be easily separated from the liquid by filtering. Coagulated albumen does not dissolve in water, but merely swells up in it; when perfectly dry, it absorbs in this manner four or five times its bulk of water. Many chemical reagents cause the coagulation of albumen in the cold. Alcohol immediately precipitates it in the insoluble form; ether does not produce this effect in so great a degree. Creosote and strong mineral acids immediately cause the coagulation of albumen. Albumen also is precipitated by alum and many metallic salts, such as silver, copper, mercury, or lead salts. On this account, the administration of raw white of egg is recommended in cases of suspected poisoning by any of the above salts: if the suspicion be unfounded, the dose does no harm; whilst if the metallic salt really has been taken, the albumen enters into immediate combination with it, and protects the body from the action of the poison, whilst other remedial measures are being taken. On the other hand, this coagulability of albumen by

metallic salts is the reason of the value of corrosive sublimate for the preservation of anatomical specimens. The mercurial salt enters into combination with the albumen and arrests putrefaction. If alkalies be present in tolerable quantity with solutions containing albumen, the solution does not coagulate when heated, but merely forms a skin over the surface, similar to that which forms on milk when heated.

Alcohol is a colourless and very thin liquid lighter than water; its burning astringent taste, agreeable odour, and intoxicating action, are well known. In its most absolute form, when exposed to a very great degree of cold, it becomes viscid, but does not solidify, and for this reason it is employed instead of mercury for thermometers which are to be exposed to very low temperatures. Its specific gravity when pure is 0·792, and its boiling point 172°. Its chemical composition is expressed by the formula $C_4\ H_6\ O_2$, or $C_4\ H_5\ O,\ HO$. It is prepared by distilling liquids which have undergone vinous fermentation, such as wine, beer, or brandy. The distillation is repeated once or twice, rejecting the parts which last came over; the alcohol, being more volatile than the water, passes over first. Alcohol is frequently contaminated with *fusel-oil*, which imparts to it a peculiar, disagreeable odour. It is difficult to separate this substance from it on the small scale, and therefore care should be taken in purchasing a quantity of alcohol that no impurity of this kind exists in it. The presence of fusel-oil in alcohol may be recognised by the taste, especially after dilution with a large quantity of water, and by the odour, especially after rubbing it between the hands, or letting it partially burn away. Alcohol, free from fusel-oil, should remain clear when mixed with nitrate of silver, and exposed to sunshine; but spirits of wine, containing fusel-oil, assume a faint red tint. Alcohol, in its strongest form, or *absolute alcohol*, cannot, however, be obtained by mere fractional distillation; for, although alcohol boils at 172°, its vapour nevertheless takes up by adhesion a quantity of aqueous vapour, hence the most highly rectified spirit obtained by repeated distillation still exhibits a density of 0·820 to 0·830. The complete dehydration of alcohol is usually effected by distilling the most highly rectified spirit over fixed substances, which have a strong tendency to retain the water: *quick-lime* is most usually employed. About equal weights of good quick-lime and strong spirit are left in contact with each other in a closed vessel for a few days; on being distilled in a water bath until about half the alcohol has come over, and this distillate being again treated with lime, and distilled as before, absolute alcohol is produced. In very careful experiments, however, it will be advisable to rectify the alcohol so obtained over dry charcoal powder and a little crystallised tartaric acid, in order to remove a slight smell which it has acquired, and also a little lime which has been carried over. Alcohol may be regarded as perfectly anhydrous if sulphate of copper previously burnt white and immersed in the alcohol does not recover its blue colour after remaining in contact with it in a closed vessel for a few hours.

Of elementary substances alcohol dissolves only a few, such as sulphur, phosphorus, iodine, &c., all of the non-metallic class. Of *inorganic* substances it may be stated as the law that all compounds soluble in alcohol are also soluble in water; but some compounds are soluble in water which are not soluble in alcohol; and substances which are soluble in both liquids dissolve more abundantly in water than in alcohol. There are, however, certain exceptions; thus, corrosive sublimate dissolves more abundantly in alcohol, especially in absolute alcohol, than in water. It may also be laid down as a general rule, that *efflorescent* compounds are insoluble in alcohol; and deliquescent substances, excepting carbonate of potassa and a few others, are soluble in alcohol. Many substances, when dissolved in alcohol, impart to it the property of burning with a peculiar coloured flame,—*e.g.* boracic acid, and the salts of lithia, baryta, strontia, lime, copper, &c.

Alcohol mixes in all proportions with ether. If the latter be in excess, a portion is separated on adding water; but if the alcohol is in excess, a homogeneous mixture is formed.

Of organic bodies alcohol dissolves all compounds consisting of carbon and hydrogen, or carbon, hydrogen, and nitrogen. In compounds containing oxygen, the solubility, as a rule, diminishes as the proportion of oxygen increases. Organic acids which are but slightly soluble, are quite soluble in alcohol; they likewise yield salts of a similar character.

(To be continued.)

A Catechism of Photography.

PREPARATION OF THE COLLODION—(*continued.*)

Q. Is bromized collodion regarded as of any great value?

A. It is; and the better it is known, and the more extensively it is employed, the more its good qualities will be admitted. The following is an excellent method of preparing it:—

Pure ether	8 drachms.
Spirits of wine, 60° above proof ...	½ drachm.
Gun-cotton	6 grains.

And

Crystallised nitrate of silver ...	2 grains.
Bromide of ammonium	10 grains.
Spirits of wine	2 drachms.

Shake well together; add one drachm and a half to every ounce of the collodion.

Q. How is the gun-cotton prepared?

A. By immersing a portion of cotton in a mixture of the strongest nitric and sulphuric acids.

Q. Are all cottons so prepared equally good?

A. It has been noticed by most photographers that the cotton exhibits great variations in solubility, and, when dissolved, in the tenacity and transparency of the fibres. Mr. Hadow, who has devoted considerable attention to this subject, says:—"The difference in properties is owing to the gradual weakening of the acid mixture in consequence of the nitric acid being removed by the cotton, with which it becomes intimately combined, at the same time that the latter gives out a proportionate quantity of water."

Q. What remedies have been suggested?

A. The authority already quoted made several interesting experiments in the preparation of gun-cotton, and five varieties were obtained. First—gun-cotton, properly so called, as before stated, quite insoluble in any mixture of alcohol and sulphuric ether. Secondly—an explosive cotton, likewise insoluble, but differing chemically from the first, obtained by a mixture of certain strength when used cold. If warm, however, either from the heat produced spontaneously on mixing the two acids, or by an artificial increase of the temperature to about 130°, the cotton then immersed becomes perfectly soluble, producing a third variety; if, however, it be thoroughly dried, it becomes in a great measure insoluble. The fourth is obtained by the use of weaker acids used cold; and the fifth, when the mixture has been warmed to 130° previous to the immersion of the cotton. In either of the last two cases the product is perfectly soluble, but there is a remarkable difference between their properties; for, on dissolving six grains of each in one ounce of ether, the cotton, treated with warm acids, gives a perfectly fluid solution (which is likewise the case with the third variety, produced by acids somewhat stronger), while that obtained by the use of cold acids makes a mixture as thick as castor-oil.

Q. What was the practical result of these experiments?

A. Further experiments were made in order to test their adaptability for photographic purposes; and it may be safely affirmed, that in this important particular there is no very striking difference.

HOW TO CHOOSE GLASS.

Q. What sort of glass should be selected for the collodion process?

A. The selection of glass for photographic purposes requires great care and judgment. The patent plate glass answers, perhaps, better than any other kind. Flatted crown glass is also very good. Common window glass is often inferior, having scratches upon the surface, each of which necessarily occasions an unevenness of coating, and an irregular action in development.

Q. Is it necessary for the glass plate to be perfectly flat?

A. Yes, this is essential. 1. Because if the glass is not flat, some parts of the image must be out of focus; and 2, the plates are apt to be broken in compressing during the positive process.

Q. How do you clean a glass plate?

A. First, the glass must be fixed in a frame by means of a wooden screw; then the surface should be washed with a mixture made with clean water and tripoli, strongly impregnated with nitric acid. The rubbing should be conducted in a circular direction with a piece of flannel rolled up in a lump; and before letting the mixture dry, the tripoli must be got off by rubbing the glass longitudinally with a second piece of flannel; subsequently it should be rubbed circularly with another piece, and then brushed with a brush of badger hair, which will render it perfectly clean.

Q. Can you suggest any other methods?

A. A mixture of water, ammonia, and emery, is found very efficacious in cleaning glass plates; they should afterwards be washed with alcohol and water. Another plan is, to put all the glass plates in the sink, where the washing water (containing cyanide of potassium) is poured. If the plate has been varnished, it should remain there for seven or eight hours; but if not, a very short time will suffice. When removed from this liquid rub the glass with the hand, wash in a large quantity of water, and then wipe dry; when required to be used, pour on it a drop of very pure alcohol, and then clean it off with two successive pieces of fine filtering paper; but perhaps the best plate-cleaning solution that can be used is that given in the PHOTOGRAPHIC NEWS, vol. i. p. 156.

Q. Is not old collodion used for cleaning plates?

A. Old collodion, which is unfit for photographic work, is a first-rate material for cleaning glass plates. Take a small tuft of cotton wool; pour a few drops on the glass plate, and rub in a circular direction till nearly dry; then finish with a wash-leather.

Q. What other suggestions can you offer on this subject?

A. First. That before proceeding to wash the glasses, each square should be roughed on the edges by means of a file or a sheet of emery paper. This precaution is necessary, as otherwise the fingers are liable to injury, and the collodion film is apt to contract from the sides, the result of which is an imperfect picture. *Second.* That cloths used in cleaning plates, which should be of fine diaper, must be used for no other purpose, and must be washed, not in soap and water, but in pure water only. *Third.* That it is advisable to use additional care in preparing the glass for positives.

(*To be continued.*)

Correspondence.

PRINTING IN CARBON.

SIR,—I presume that the carbon prints laid before the Society by Mr. Pouncey at their last meeting may be considered the best he can produce, and that when they are criticised he will not turn round and say—"Oh! the thing is in its infancy yet. It is not fair to judge of my process by what I have been able to accomplish hitherto." This argument was made the most of on Tuesday night: we were exhorted to assist Mr. Pouncey in improving his process, and so forth. Now I have no hesitation in saying that his process is incapable of improvement. I do not see the slightest reason for believing that, if he were to work at it for the next twenty years, he could produce anything better than one or two of the prints he exhibited last night, and for this reason:—The carbon has to be ground as painters grind their colours, and everybody is aware that there is a limit to the mechanical division of substances which cannot be passed, consequently, these particles of carbon remaining unaltered (chemically) on the surface of the paper, give a sort of grain to the picture, which enables anybody to detect, with the greatest certainty, a carbon print from a silver print from the same negative when the two are placed side by side, as was the case on Tuesday night. This same opacity of the carbon renders the prints taken by the process far inferior to the silver prints in the matter of aërial perspective, as they do not possess the delicate tones of a silver print. In the latter there is a gradual and beautiful shading of the light into darkness, which is not to be found in the former. In the pictures exhibited last night, for instance, by Mr. Pouncey, and which had been most certainly prepared with the greatest care, these drawbacks were distinctly visible to everybody capable of distinguishing a good photograph from a bad one. I wish it to be clearly understood that I say this of the *best* pictures exhibited by Mr. Pouncey.

Perhaps I can best explain my meaning to those who have not seen these pictures by saying, that whereas, in the silver print, the stone columns appeared perfectly smooth and unworn, in the carbon print they had a weather-beaten appearance—due, undoubtedly, to the particles of carbon remaining on the surface of the paper; and this, I repeat, will always be the case with carbon prints, inasmuch as mechanical subdivision cannot be extended beyond a certain point, which is far surpassed by the action of chemical re-agents.

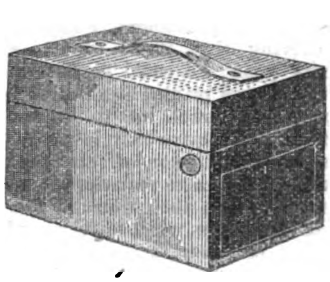
I freely admit that the carbon process may be made useful, but I do not admit that it can ever equal the process of silver printing. It has been urged by some, that, even if the carbon process be in some respects inferior to the silver process, yet its undoubted permanence renders its employment advantageous, seeing that nearly all silver prints fade away. In the first place, a carbon print is *not* indestructible, as our respected vice-president, Mr. R. Fenton, very judiciously remarked. Neither is it fair to assume that, because carbon is unassailable by many chemical agents which attack chloride of silver, it is as insensible, when in combination with bichromate of potass, as in its pure state, to the effect of light and gases, which have a deteriorating effect on silver prints. In the next place, I entirely agree with Mr. Malone that there is not an absolute necessity that silver prints should fade. I could offer the contents of my own portfolio for examination; but I can refer to the statement of Mr. Malone for a more striking confirmation of this, viz., that a photographic print taken in 1844, upon which no particular care has been bestowed, remains at the present moment in precisely the same state as when printed, having lost no portion whatever of its original brightness and freshness during all the years which have since elapsed. There is no doubt, either, that numbers of photographs of "many years' standing" exist in gentlemen's libraries of which we know nothing.

Under these circumstances I would not advise any photographer to abandon the process to which he has been accustomed, but rather to turn his attention to discovering a method of rendering them *undoubtedly* permanent; and I take this opportunity of protesting against any expenditure of the Society's money on Mr. Pouncey's process. He must be driving a very fair trade in carbon and other *matériel* connected with his process which, together with the sum collected for him by his Jersey Mecænas, must be paying him very well indeed for what he has done.—I am, sir, your obedient servant,

AN *ex*-MEMBER OF THE COUNCIL.

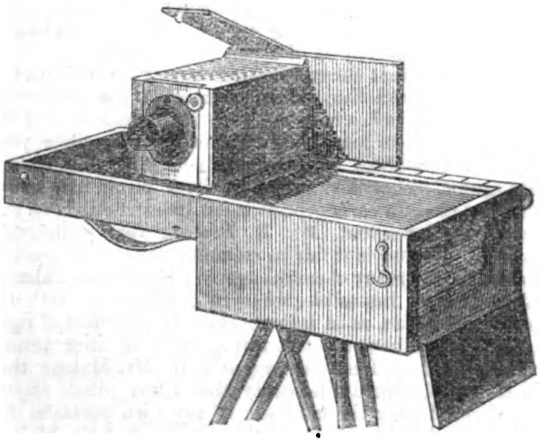
PORTABLE STEREOSCOPIC CAMERA.

(*Registered December 27th*, 1858, *by* T. H. Powell.)



The drawing above exhibits the apparatus when closed, in which condition it is carried by the leather handle on the top. It contains all that is necessary for taking eight stereoscopic pictures by any of the dry processes. The outside measurement is 9 × 5½ × 6 inches, and the weight is 5 pounds.

To set up the apparatus for use:—Screw it on the stand with the lock towards the left hand, for which purpose a plate is let into the bottom of the box; unlock, and turn back the lid; raise the camera, which is a folding one; press the front into its position (the lens being already on it); turn the camera at right angles, with the lens pointing towards the object to be taken; open the door at the end of the box; take out the back holder and gray glass, and place them in the groove at the back of the camera made to receive them. The apparatus will then be as represented in the drawing below.



The camera slides on a groove, which is continued along the top of the box and the inside of the lid; by this means a movement of any length up to 13 inches can be obtained, and can be varied according to the distance of the object from the lens. A scale of inches is engraved on the edge of the groove, to determine the length of movement; a portion of the groove is also made moveable at the left-hand side by a screw, in order to adjust the angle. The brass mounting is constructed to take two lenses of different foci, the one not in use fitting on to the door of the box.

To arrange the apparatus for taking a picture:—Slide the camera to the right until its right-hand edge rests on the line registering the number of inches of movement required to be used; notice the portion of the object cut by the pencil line in the centre of the gray glass; move the camera to the left as far as the groove will allow it to go, and if, on again looking at the gray glass, the same part of the object touches the line, the angle is correct; but if a movement has taken place, the screw which adjusts the moveable part of the groove must be turned until the object is the same as when the camera was in its first position. Having properly adjusted the angle and focussed the picture, remove the gray glass and substitute one of the double backs (four of which are contained in the box, each holding two prepared plates). To expose the picture, proceed in the same manner as with an ordinary stereoscopic camera, taking the first picture on the right-hand side, and the second on the left.

The object in the construction of this apparatus has been to make it as portable, and at the same time as simple, as possible, so that it may be easily put together; also, to avoid the use of loose pieces, which are objectionable from their liability of being left behind when packing up. A specimen can be seen at Messrs. Horne and Thornthwaite's, of Newgate-street, by any one wishing to judge of its capabilities.

A NEW METHOD OF PROTECTING VALUABLE NEGATIVES.

Dear Sir,—Like many other persons, I have often had the misfortune to injure collodion negatives on glass that were valuable, or, from various circumstances, could not be replaced. This has occurred to me most frequently while printing from them; but sometimes it has happened in carrying them about, or, from not putting them by with sufficient care.

To guard against such accidents as this, I have been led to contrive the following simple plan for their effectual protection; and thinking that it may prove useful to many amongst the numerous readers of your widely circulated journal, I beg to place it at your disposal:—

I first varnish the negative with a hard varnish, in the usual manner. Then I take either a sheet of very thin talc, or of the fine glass made expressly for covering microscopic objects, of the same size as the plate to be protected. This I lay upon the varnished surface, and secure it in the correct position by binding the edges of both together with narrow slips of gummed paper. Both the talc and the microscopic glass may be readily procured less than the $\frac{1}{100}$ of an inch in thickness. Owing to the extreme tenuity of either of these materials when thus employed, not the slightest indistinctness will be produced in the positive taken from a negative after being thus prepared. Herewith I enclose a print for your inspection, which was taken from a negative protected in the manner just described, and I think you will agree that there is no loss whatever of sharpness or definition by the process employed.

It will be seen that, by this simple arrangement, the great advantage will be secured that, *any number of impressions may be printed from a negative when thus treated, without in any way injuring its surface*, and it follows that the last impression will be in every respect equal to the first.

To those who print from stereoscopic and other negatives for sale, the plan will, I think, prove very valuable. When an inquiry has been made of such persons for a particular picture, I have frequently heard them reply, "Oh! we cannot print any more of that subject, the negative is quite worn out." Now such a result could not occur were my method adopted; and as very high prices are frequently given for first-class negatives, it must be a matter of importance to obtain as great a number of copies from them as possible. The public would also be benefited by the reduction in price of each copy, if the number of impressions which could be taken from a single negative were almost unlimited.

If at any time the talc or glass, as the case may be, should be scratched or otherwise injured, by passing the point of a penknife round between the edges of the plates it can be readily removed, and replaced by another piece in the same manner as before. Not the least recommendations in its favour are, its simplicity, and the fact that—as there is not the slightest risk of injuring the picture in its application, no person need fear to make a trial of the plan, even upon the most valuable negative in his possession.—Believe me, dear sir, yours very truly,

John Browning.

111, *Minories*.

[It might be imagined that the plan recommended by our correspondent would have the effect of injuring the sharpness of the resulting positive; from experiments which we have witnessed, however, we can assure our readers that the slight diffusion which the light would necessarily experience in its passage through the protecting film, is so small as to be quite inappreciable, except perhaps when the printing has to be effected by means of a prolonged exposure to faint diffused light: and, even in this case, we hardly think that it would be attended with any more serious effect than a slight increase of softness and artistic effect.—ED.]

Photographic Societies.

LONDON PHOTOGRAPHIC SOCIETY.

THE usual meeting of the London Photographic Society was held on Tuesday evening, which was presided over by Mr. R. Fenton.

After the usual routine business had been disposed of, the President called the attention of the meeting to the subject under discussion, viz.—the adjourned debate on carbon printing.

The first who rose was Mr. Pouncey, who read—as well as he was able—a round-text composition, which contained nothing whatever of importance, but consisted mainly of a series of innendos against sundry persons and periodicals. His mode of printing was elicited in the course of the subsequent discussion, and consists in taking a saturated solution of bichromate of potass, a common solution of gum arabic—"he could not tell precisely what quantity of gum should be dissolved in an ounce of water; he had tried to dissolve a certain quantity in an ounce of water, but (to his great surprise, apparently) a quantity of the water had evaporated by the time the gum was dissolved, and *therefore* he could give no definite proportions." These two solutions are to be mixed together in equal quantities, and after that a certain quantity of finely-ground carbon (in the proportion of one to eight of the combined solutions) is to be added to the mixture. The paper on which this is to be applied, should be what he termed "half-sized." The sheet should be laid on a glass plate, or some other hard and smooth surface, and a quantity of the solution poured on and allowed to remain on for about two minutes, after which it is to be brushed off with a "hog-hair" brush as cleanly as possible, and exposed under a negative in the usual way. After an exposure of an indefinite period, it was to be removed from the printing-frame, and immersed in water also for an undefined period, and finally washed under a tap.

After this paper had been "got through," the Secretary read a letter from Dr. Holding, who said he had purchased paper, carbon, &c. of Mr. Pouncey, and had followed his instructions; but the results (which he forwarded) were far from brilliant. There was nothing to tell him when the picture had been exposed enough; "but with certain modifications," &c. &c., it might become useful.

It was a great relief to the meeting when Mr. Malone replaced Mr. Pouncey at the table. Having cleared himself of the aspersions that had been cast upon him by the latter individual, he proceeded to place the subject of carbon *versus* silver printing on its proper basis. We regret that we have not space to give his remarks at length; but we may briefly say that they demonstrated that, inasmuch as a certain proportion of silver prints still exist unchanged after the lapse of so many years, it follows that there is no inherent cause of fading in the silver print, but that it must be attributed to imperfect washing, arising from the ignorance of photographers at one time with respect to the importance of freeing the picture from every trace of the hyposulphite of soda. He maintained that a silver print, carefully washed and preserved in a portfolio, where it could not be attacked by sulphurous vapours, was a permanent print; and he therefore warned photographers not to take up hastily a process because it was new, and which in its present state was undoubtedly inferior to the silver process.

Mr. Malone was succeeded by Mr. Shadbolt, who rose to reply to a charge made by Mr. Pouncey, that he, Mr. Shadbolt, had changed his opinion on the subject of carbon printing—or, as Mr. Pouncey poetically expressed it, "a change had come o'er the spirit of his dream." He did not deny that he had modified his opinion; circumstances had changed since he first expressed one on the subject. With a Machiavellian inspiration he sought to weaken the connection between Mr. Pouncey and his patron, by saying, in the most uncompromising manner, "that Mr. Sutton had done him, Mr. P., greater harm, both in opinion and fact, than any other person." He then pointed out in the carbon pictures one or two points in which they were inferior to the silver pictures from the same negatives, notably in the want of "atmospheric effect;" but there was evident, throughout his remarks, a desire to deal gently with the man upon whose process he had once looked so coldly; and eventually they finished by fraternising, the Dorchester lamb reclining beside the literary lion during the remainder of the evening.

The discussion was continued in a somewhat desultory manner. Mr. Pouncey stated that Lord Hastings had asked him if his pictures were well fixed, because he had a volume of the "Pencil of Nature," the prints in which had faded away; to which he replied, "I don't know, sir," or, "me lard," or something of that sort, "but I think my picters won't fade." He went on to say that it was admitted in an article on "Questionable Subjects for Photography," which appeared in a photographic periodical, that silver prints would fade; and he took this as an admission that silver prints were none of them permanent. Mr. Shadbolt, referring to the same article, said, that this statement "was a very loose statement of a very loose writer." It did not seem to occur to this gentleman that questionable photographs are, we are bound to believe, the work of questionable photographers, and that it is therefore wholly unfair to assume—that the observations which applied to such subjects are to be taken as applying to all photographs.

Mr. Malone was obliged to rise repeatedly during the evening to correct perversions of his statements by some of the speakers. Reference was also made by several of those who addressed the meeting, to the possible good results which might arise from the *sel d'or* process of toning prints. One of them, who expressed himself with much more common sense than grammatical accuracy, said that it had been tried, and with very satisfactory results. He also spoke very favourably of the daguerreotype process, and, remarking on the bluish tint which sometimes becomes visible on the plate when suspended over the fire-place, he said, that this tinge, which is due to sulphuration, may be removed with a little cyanide of potassium; and he asked, "has any photographer tried the effect of cyanide of potassium on a silver print?" "Yes!" exclaimed a voice. "What was the result?" he asked. "Out!" replied the voice. This very simple and laconic answer was received with a shout of laughter, which, at all events, gave satisfactory evidence of the condition of the lungs of the gentlemen present.

The President then rose, and, in a neat little speech, offered the thanks of the meeting to Mr. Pouncey for his paper; and also to Mr. Paul Pretsch for his kindness in being present with the intention of reading a paper on his process of photo-lithography; but as it was too late to read it then he trusted that that gentleman would read it at the next meeting.

Miscellaneous.

M. CORBIN'S DRY COLLODION PROCESS ON PAPER (VOL. I. PP. 182, 196.—The report of the committee, consisting of MM. Bayard, Alfred Coulon, Gabriel de Rumine, and Gaillard, appointed by the French Photographic Society to examine the dry collodion paper process of M. Corbin, is as follows: "Gentlemen,—Charged by you with the examination of M. Corbin's collodionised paper process, we have the honour to render you an account of our examination. Without entering into any details on the preparation and use of M. Corbin's paper, details which we find described by the author himself in the last number of the *Bulletin*, we have to inform you that the author has prepared and used his collodionised paper in our presence with complete success. A sheet sensitised the previous evening by M. Corbin was exposed for five minutes before a house illuminated by the sun, with an object glass 50 centimètres focus, and a diaphragm 12 millimètres in diameter. The proof was perfectly developed in about a quarter of an hour, without any spot, slowly and regularly. The negative, if it has not attained the delicacy of those obtained on glass, far surpasses, especially as regards dis-

tances, the best negatives on paper. In fact, as to delicacy, it appears to us in all respects similar to a negative on collodion transferred to paper. The time of exposure and of development are sensibly the same as for the Taupenot process. In conclusion, M. Corbin's process appears to us a great improvement as regards convenience in photographic tours, inasmuch as it allows of one carrying surfaces as sensible as the Taupenot collodion, capable of giving much finer proofs than paper, and that without the drawbacks inherent in the glasses on account of their weight, their price, the space they occupy, and their fragility. The committee proposes that you should thank M. Corbin for his communication." These resolutions were adopted. —*Bulletin de la Société Française de Photographie.*

Note to our Algerine Correspondent's Letter, Vol. I., p. 5.—In one of the early letters of the gentleman who has forwarded us several communications from Algeria, it was stated that several Arabs had been executed for the murder of the greater part of a family named Gilson. One of this family, the eldest daughter, he stated, had been frightfully mutilated, both of her hands having been cut off at the wrists, and her head nearly cleft in two, and that, notwithstanding, she still survived, and had been sent to a hospital in Paris. It gives us pleasure to announce that, Prince Napoleon's attention having been called to the circumstance, he has kindly taken the case of the poor girl into his consideration, and has, as we are informed, expressed his intention of providing for her for the remainder of her life.

The Crystal Medium.—Under the above name an enterprising firm are introducing talc, in the form of clear, thin pieces, for the purpose of superseding glass in the production of positive and negative collodion pictures. We think that this is a step in the right direction, as the employment of so flexible and tough a substance cannot fail to render the injury of valuable negatives much less frequent. Another useful application of this substance is pointed out in Mr. Browning's letter, published in this number of the "Photographic News."

Photographic Notes and Queries.

DETERIORATION OF GLASS BY EXPOSURE TO THE LIGHT.

Sir,—As some little stir has been made lately relative to the changes that glass undergoes by being exposed to light in operating rooms, the following facts may put the matter in another light, and go far to prove that glass is not so changeable as it is supposed to be. Three years ago I had built for me a small glass house here, and glazed the two skylights with the common 16 oz. sheet glass, with 12 panes 4 feet 3 inches long × 13 inches wide. In the first year portraits could be taken in 3 seconds generally; next year the time was increased to 6 seconds; and this year to 9 and 11 on clear days. As this was a serious inconvenience in taking babies' portraits, I had the glass well cleaned with whiting and water; but this produced no good result, and the time was still about the same. But now, being about to remove to another part of the town, I had the lights again cleaned, and this time with a strong solution of hot water and cyanide of potassium, well dried off with clean cloths, and this proved quite satisfactory,—the glass appeared clear as crystal, and on trying it at this time of the year, I find I can take portraits in 3 or 4 seconds. Thus I am led to conclude that the glass does not change, but acquires a thick deposit of organic matter, not removable except by some such powerful agent as that above mentioned.

Swansea. Thos. Gulliver.

PHOTOGRAPHIC DESIDERATA.

Sir,—As a practical photographer I feel persuaded that many beside myself have often regretted the results of working with porcelain baths and dishes, and yet it appears strange so few complaints have been made—too few, indeed, to induce the glass manufacturers of this country to turn their attention to the subject in a commercial point of view. I am perfectly aware cemented or *built* glass baths and dishes may be had by the shipload, but they are all liable to a serious defect—leakage, after some little service. The French cast glass baths and dishes are all more or less twisted, warped, and bulged, and necessitate the use of large quantities of silver solution. What photographers require are—well-moulded vertical glass baths of uniform thickness, not more than ½ or ¾ inch in *width* (to economise solution), and higher than usually made, to allow the fluid to rise without overflowing when the plate is immersed. All the glass baths I have seen are much too wide; the one I work with for plates 8½ × 7½, requires 40 ounces of nitrate solution to fill it properly. If *properly* constructed, half the quantity would suffice. Good, *flat*, well-moulded glass dishes are also much needed, with a spout, after the fashion of the little stereoscopic developing dishes, which are perfection in their way.

And, lastly, "a stereoscopic petzval lens" is a consummation eminently to be desired. All who have seen specimens of the working of the large lenses of this kind, will, I think, unite with me in the hope that some of our leading opticians will favour us with this boon "with the spring and with the flowers," and enable us to furnish the public with stereograms such as they or we never saw before.

George Eddowes.

TONING WITH PLATINUM.—PRINTING IN CARBON.

Sir,—May I ask whether bichloride of platinum might not be substituted for gold in the toning bath for paper prints? and if not, why not?

Platinum belongs to the same category of metals as gold, and, I should fancy, would be deposited like the latter on the surface of the altered chloride of silver; while in cheapness it has a very great advantage, being, I think, not more than 25*s.* or 30*s.* the ounce. No doubt, however, there are reasons for its non-employment, or we should have heard more of it ere now; but would you kindly enlighten my ignorance on the subject?

Might not waxed paper, or M. Gaumé's paper-glass be employed to receive the bichromate of potass and sugar, suggested by Mr. Mabley for carbon printing? The strong acid would then leave the lights uninjured.

Gwenthlian.

[Bichloride of platinum has several times been suggested as a substitute for the expensive terchloride of gold, but hitherto, we believe, the drawback to its use has been the inferior colorific properties which it possesses. We think it is a question which is well worth the attention of experimental photographers, and should be glad to hear of its being successfully solved. The suggestion as to the employment of a non-absorbent paper for carbon printing is good, and is well worthy the attention of those who are experimenting in this branch of printing.]

VARNISH FOR PAPER STEREOGRAMS.—ORMOLU FOR COLOURING GOLD FRAMES.

Sir,—I see two requests in vol. i., p. 191, of the "Photographic News" which I think I can assist in answering. The first is for a method of varnishing coloured prints. Take a flat camel-hair brush and pass over the print *once only*, and only one way, with a tolerably strong parchment size, missing between each stroke of the brush a space a little narrower than the breadth of the brush; put aside to dry, when quite dry size the intervening spaces which have been left in the same way as before; avoid having too much size in the brush, and pass over the print as lightly and quickly as possible. A second coat may be given when dry, without missing any part, as the first coat is a complete protection unless by too hard rubbing; after which, when quite dry, varnish either with mastic or dammar-varnish. The cause of the appearance complained of is the varnish penetrating the paper,—the size prevents this. It may be got from any gilder for a mere trifle.

The second request, by a gilder, is answerable thus:—1 pint methylated spirits, ½ oz. orange shellac, ½ oz. seed lac, ½ oz. gum benzoin, dissolve and add to your ordinary finishing size; if too pale, add extract of either dragon's blood, red sandal root, or anatto, to the required tinge; if not flat enough, add more seed lac and gum benzoin. Strain through muslin before using. W. H. D.

Edinburgh.

NEW PRINTING PROCESS.

SIR,—I herewith forward you the particulars you were so kind as to solicit in a former number of the "PHOTOGRAPHIC NEWS."

1. Dissolve as much gelatine in a saturated solution of bichromate of potassa as will make a fine jelly when cold, the proportion of gelatine does not much matter; coat paper with this, and when dry expose under a negative in a printing frame.
2. After exposure, wash well till the whites show no trace of yellowness, then immerse in a saturated solution of protosulphate of iron. Wash and soak well.
3. Pass the print in a saturated solution of gallic acid, then lay it face upwards on a glass plate to develop. This facilitates the action of the oxygen of the air in giving better blacks.
4. When the print is still on the glass, pour over it some of the following solution:—Saturated solution of acetate of lead, with one-fourth of its bulk of glacial acetic acid. This solution improves the lights. There is no danger of over printing, and thereby producing negatives; the effect being the same as in a silver print.

Should the print be very dark, passing it in a very weak solution of nitric acid will lighten it very much, but it must be washed directly.

It may be as well to remark, that the more gelatine there is in the sensitising bath, the darker and the sharper will be the print. H. C. JENNINGS.

TRANSPARENT ENAMEL PHOTOGRAPHS.

SIR,—In vol. i. p. 177, you mention a process for which a Mr. Glover has taken out a patent; and as doubtless many of your readers may feel inclined to practise a similar mode of producing transparent positives without incurring the expense and annoyance of procuring a license, allow me to publish, through the medium of your columns, a process that for years I have been in the habit of printing, by superposition, similar transparent positives upon wet and dry collodion plates, upon the former by simply well draining upon blotting paper, and placing two slips of paper between the ends of the sensitive plate and the negative to prevent contact, exposing to daylight, or, what is better this dull weather and these long evenings, for a few seconds to a steady gas-light: develop with the usual iron or pyrogallic developing solution; after fixing and drying, back up with a good white enamel paper, or with a thick solution of white shellac in spirits of wine, containing a portion of precipitated chalk.

It is of course self-evident that a dry plate will give a sharper picture, and that it is also more readily manipulated than a wet one; but by using thin paper to prevent the negative touching, I do not find in practice any apparent difference between the two. P. COOKE.

Upper Seymour Street, Euston Square.

CEMENTING GLASS TOGETHER.

SIR,—In answer to your wish for information from some of your correspondents on cementing glass together, I would advise the employment for that purpose of *pure white* shellac—sold in sticks, somewhat similar in appearance to barley-sugar—instead of marine glue.

It can be very efficiently applied by first making *hot*, over the flame of a spirit lamp, both the pieces of glass to be joined together; then burning the shellac in the flame, and applying it to one of the pieces of glass—just as sealing-wax is applied to paper—and rubbing them both firmly together for a few seconds, and letting them remain still till quite cold, when the union will be perfect, and, as far as I have found, much firmer and more enduring than if effected with marine glue. W. G. G.

CEMENTING GLASS TOGETHER.

SIR,—With reference to your reply to "Y. Z." in No. 17 of the "PHOTOGRAPHIC NEWS," there is no doubt that marine glue is (as you say) the *best* cement for joining glass. Where this cannot be got (as is the case in this town), I have found a strong solution of shellac in alcohol to answer very well, with careful usage. It is perfectly water-tight, but will not bear very rough handling. It should be applied to the edges or surface of the two pieces of glass, as the case may be, and then held close to the fire until thoroughly hot; press the pieces together firmly, and when cold, if air bubbles have been avoided, it will be found to adhere very closely. E. S. C.

PRINTING ON IVORY.

Several inquiries having been made on the above point, we should feel obliged if any correspondent who is in possession of a good method would favour us with the details.—ED.

SYNOPSIS OF PHOTOGRAPHIC PROCESSES.—FOTHERGILL'S.

Clean plates.
Coat with collodion; let well set.
Place in bath ½′ to 1′; get rid of oiliness.
Wash gently on a levelling stand with water, 4 drachms, 15″ to 20″.
Pour albumen on and off several times.
Wash in a well dish with two changes of water ½′ each.
Dry.
Expose.
Moisten with water.
Develop, 3 drachms of A to 1 of B.
Wash.
Fix.
Wash.
(The above quantities for stereoscopic plates.)

Albumen:—

White of egg	... ...	1 ounce.
Liquor ammoniæ	... ...	7 minims.
Water	... ...	1 ounce.

Developing solutions:—

Pyrogallic acid	... ...	1 grain.	A
Glacial acetic acid	... ...	20 minims.	A
Water	... ...	1 ounce.	A
Nitrate of silver	... ...	4 grains.	B
Water	... ...	1 ounce.	B

Fixing solution:—

Hyposulphite of soda	... ...	2 drachms.
Water	... ...	1 ounce.

H. S. I.

WHAT TO AVOID IN PHOTOGRAPHY.

Do not shake the camera when removing the cap from the lens.

Do not look at the sitter when taking a portrait.

Do not be hasty in observing an alteration of colour in test paper.

Do not pour on collodion near a naked flame.

Do not keep sensitive positive paper unused longer than possible.

Do not use rain or common water for preparing the nitrate bath.

Do not print on positive paper until it is quite dry.

ANSWERS TO MINOR QUERIES.

COLOURING PHOTOGRAPHS.—*A. H.* In attempting to prepare his own colours for dry tinting, our correspondent will meet with more difficulty and less success than he probably anticipates. It is not sufficient that the pigments be comminuted to their utmost fineness; other treatment is required to make them adhere well to the plate, and different pigments require different modes of treatment. The waste from repeated failures would probably make the experiment an expensive one. It is not absolutely necessary, however, to procure a full complemnet of tints at the outset. We subjoin a dozen, with their names and numbers as classified in the list we use, with which a very good commencement may be made:—Flesh, dark, No. 1 and No. 2; complexion, No. 1; carmine; blue, No. 2; green, No. 3; damask; brown, No. 1; violet; horizon; silver gray; and gray, No. 4.

FILTRATION OF FINELY-DIVIDED PRECIPITATES.—*S. Johnson* has prepared some metagelatine by the plan recommended in vol. i. p. 202, by Mr. Heisch, with some slight modifications; he has heated the glue and dilute sulphuric acid together for the time there recommended, but afterwards, for the more complete separation of the sulphuric acid from the liquid, has saturated the acid by adding precipitated carbonate of baryta, until effervescence has ceased. This he has attempted to filter through bibulous paper, as recommended; but after several times passing through the very finest paper he can procure, it still comes through milky. The cause of this is, that the precipitated sulphate of baryta is a powder of such exceeding fineness that it is not arrested by the pores of the filter paper. In chemical experiments this difficulty is a serious inconvenience, as some of the most usual methods of quantitative analysis depend upon the absolute separation by the filter of the precipitated sulphate of baryta from the solution, and several plans are in use for causing the sulphate of baryta to cohere together in larger particles; but these would be inapplicable in the present case. The following plan is easy to perform, and will be found to answer perfectly:—Filter through ordinary coarse filtering paper, in order to separate the bulk of powder from the solution; allow the filtrate (which will be milky) to get almost cold, and then add three drops of white of egg to each ounce of solution; shake up well together, and then boil violently for a few minutes; the albumen will coagulate in the liquid, and will carry down with it the whole of the finely-divided suspended sulphate of baryta. The liquid will now filter with the greatest ease and rapidity through the bibulous paper, and will yield a perfectly bright filtrate.

TER-CHLORIDE OF GOLD.—*F. M. Y.* To prepare this salt place a piece of metallic gold in a flask, and pour over it a mixture of two parts of hydrochloric acid and one of nitric acid—both pure and strong, heat gently, when the action will soon commence. If effervescence ceases, add fresh acid until all the gold is dissolved; then evaporate in a water bath nearly to dryness; moisten with pure hydrochloric acid, and evaporate again to dryness, and then preserve in a well-stoppered bottle for use. It will be a reddish orange mass, very deliquescent. It will therefore be better to keep it in solution, of such a strength that one drachm of liquid shall contain one grain of terchloride. If the weight of the gold originally taken be known, and the operation be conducted without waste, the amount of terchloride obtained can easily be calculated without being at the trouble of weighing this deliquescent salt; ten parts of metallic gold will produce about fifteen of ter-chloride of gold.

FORMATION OF A PHOTOGRAPHIC SOCIETY.—*P. S.* and some friends wish to establish a photographic society in their city, but do not know how to begin. We shall be very happy to render all the assistance in our power to any persons wishing to effect such an object. In our opinion, the best mode of operation would be to talk the matter over with private friends until the preliminaries were agreed upon, then to form themselves into a provisional committee for the purpose of agreeing upon a set of regulations, &c., and then to call a meeting on a certain day, by advertisement or otherwise, of all persons desirous of forming a photographic society. The meeting having assembled, one of the provisional committee should briefly state the object of the meeting, saying that such and such gentlemen had agreed upon certain regulations, and then submit them to the meeting. Some one else should then propose that the rules be adopted; and then, after electing the officers and council, the formation of the society will be *un fait accompli*. We shall be very happy to look over a set of the proposed rules, if our correspondents think that our experience will be of service to them.

PRESERVATION OF DRY COLLODION PLATES.—*C. Buxton.* It will not be safe to store dry plates away in deal boxes, as the turpentine effluvia always hanging about the wood will be liable to cause fogging. Good tin boxes can now be procured at a small cost at most photographic instrument makers, and should be used in preference to deal.

TO CORRESPONDENTS.

☞ Some complaints having been made by our subscribers as to the non-receipt of the "PHOTOGRAPHIC NEWS," the publishers beg respectfully to notify that every care is taken on their part to insure punctual and correct dispatch. All complaints should, therefore, be made to the Post Office authorities.

H. E. N.—The principal advantage which a view lens possesses over a portrait combination is the comparative cheapness; a single lens covering a 10 × 12 field can be purchased for £5 or £6, whilst a double combination to cover an equal extent, would cost nearly six times that sum. Besides which there is a danger of centralisation of light in the picture; whilst the greatly increased weight and bulk of a large double combination would render a photographic tour, with such a companion, a formidable undertaking.

P. S.—No really practical panoramic camera has yet been devised. 2. *Instantaneous* photography requires the lens, light, and chemicals to be at their best. Wet collodion must be used, and the lens should have a short focus. 3. It is incorrect in principle.

J. H., Junr.—We do not think any plan will be available for restoring negatives which have become scratched. If the marks are not in very conspicuous places you might, perhaps, manage to touch them with a little paint so as to partially remedy the defect.

J. J. D.—We are much obliged.

L. W. B. W. H. H.—1. To prepare a good dead black paper, coat it with a mixture of very thin glue and lamp-black applied hot. 2. Use a rather stronger iodised collodion.

J. BELL.—Write to the publishers.

S. E.—Professor Wheatstone, the greatest living authority on such matters, has mentioned to us that the two positions of the camera in taking stereograms should not form any angle with each other; but that the two positions or two lenses, if a twin lens camera be used, should in all cases be strictly parallel. This will cause any particular spot in one view, not at a great distance off, to occupy a different position on the ground glass when focusing for the other view.

T. J. D.—Have you tried your proposed funnel? We hardly think it would be so successful in practice as you think.

J. L. D.—The best formula we know of is the one given in vol. i. p. 86. You will observe that most of the solutions are alkaline. We do not think your old toning bath can be made available for further use; do not, however, throw it away, as we hope shortly to give a plan for recovering the precious metals from such solutions. We have not tried Mr. Nevile's process yet, but should think from the description that it would be about as good as—neither better nor worse than—any of the score of changes which have been or will be rung upon the chemical bodies at present in the hands of photographers. It reminds one of a remark we once heard made on taking medicine—"putting substances that we know nothing about into something that we know less about." If you wish to try it, use one grain of citric acid to the ounce.

E. S. C.—It is our intention to do what you ask, but possibly some time may elapse first.

A LOVER OF PHOTOGRAPHY.—The address of the Photographic Society of Ireland is, Royal Dublin Society House, Dublin. The address of the other is simply the name of the town. Neither publish journals.

T. COLLINS.—1. It will be attended to in future. 2. Place the stop close to the front lens, either in front or behind.

S. Y.—1. You must be mistaken as to the firm you mention saying that there is no such thing as chloride of cadmium. It is a well-known definite salt, and is or ought to be kept at all dealers in photographic chemicals. 2. Place a small piece of clean zinc in your red collodion.

J. E. K.—Your silver bath is not strong enough. Your other pictures do you great credit.

F. L. G.—The toning bath prepared with iodine is radically bad, and we advise you to have nothing to do with it. We do not know how the pictures you mention are prepared.

J. C. W.—Try the collodio-albumen process. We have attended to the other matter by post.

Communications declined with thanks:—J. R.—Joynson.—F. P. P.—T. L. M.—Rosshire.—An Amateur.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "PHOTOGRAPHIC NEWS:"—C. K. D.—A Working Man (see our Notes and Queries). A. B. C.—H G.—A. N.—Suffolk.—A Correspondent whose signature is perfectly illegible.—O.—A Tyro.—T. J. M.

IN TYPE:—J. M.—W. D.—T. W.—J. T.—R. W.—H. E. N.—H. S.—Norma.—Viator.—An Amateur.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. CROOKES, care of Messrs. Cassell, Petter, and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 19.—*January* 14, 1859.

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

In the early days of photography, the exhibitions of this society had much more interest, for the scientific photographer, than they possess now. This was in a great measure owing to the uncertainty with which experimenters worked,—no process being then known which had all the requisites to enable the photographer to produce a satisfactory picture. Collodion was in its infancy, and thus, as a consequence, every photographer tried his own peculiar "process;" and it was not until he had sent his pictures to the exhibition, that he was enabled to see whether the results of his own method were inferior, equal, or superior to those of others. As gradually the capabilities of collodion were developed, a change has been perceptible in the character of the exhibitions. Photographers now seem pretty well satisfied of the superiority of that process, and the result is, that the majority of pictures exhibited are collodion. The attention of photographers has thus been turned from the chemical to the artistic department of the science; each photographer has endeavoured to surpass his competitor in beauty of manipulation, which, combined with great artistic talent in many instances, has given to photographic exhibitions more *public* interest; for it is well known the public generally care little about this or that process, so long as they are presented with pictures that are interesting or pretty. To this, then, we may attribute the rapid advancement which has been made of late years in the artistic department of photography. Now we would not for one moment attempt to underrate the great importance of art in connection with photography, for we are convinced that it will ultimately prove of such service to art, that it would appear enthusiastic and utopian to prophesy on the subject. But at the same time we feel that our particular mission is not so much the promotion of art, as the promotion of photography,—chemical photography, whereby we may obtain greater and more satisfactory results than we have hitherto done. As we have on other occasions remarked, we do not see that the society has done much for the advancement of the art, nor do we think that it is in its power to do so; but still the course which it at present pursues is the one least calculated to do this. For it will easily be seen from the foregoing, that with each succeeding exhibition there should be some change. Photography is making too rapid advances to allow of our pleading what was done a twelvemonth ago, as a precedent for present action. We have shown how the character of each exhibition has changed, until we have now only a repetition of preceding exhibitions. The present course of exhibiting nothing but pretty pictures, is merely doing what any enterprising publisher could accomplish—it is, indeed, only acting as a large rival publishing establishment, with all the advantages accruing from an associated body of gentlemen. What we wish to see in such exhibitions is, not merely a great trading establishment and gigantic advertising medium, but some amount of scientific information in addition to all these pretty pictures. How this can be done, will be seen with a moment's reflection. There is no denying the fact, that the society has at its disposal means which might enable it to collect specimens of all the discoveries, important or otherwise, which are every week being made public. No private person could hope to accomplish this; and therefore it is undeniably a duty incumbent upon the society, if it has not departed from its avowed object, viz., the promotion of photography. As an instance in point, we may mention that there is a strange omission from the present collection—there is not a single impression of Mr. Fox Talbot's photoglyphic process; although we have several by Mr. Paul Pretsch of an old process, which is confessedly inferior to Mr. Talbot's in its capabilities, and so near it in scientific principles as to be regarded by many as an infringement of that gentleman's patent: this, surely, should not be the case with a process, which promises one day to be the leading feature of photography. Photographers who visit these annual exhibitions should be assured that there is really something to be seen which would repay a visit. As to the scientific applications of photography it would be needless to recapitulate them here, as there is no science to which it cannot be applied in all the details of each branch. In these exhibitions, specimens of the application of the art to all the various sciences should be displayed. Astronomy, meteorology, chemistry, geology, optics, electricity, crystallography, botany, natural history, are all indebted to this wonderful art; and, surely, specimens of such applications as these—pictures which show the ingenuity and power of the intellectual class of photographers—deserve some little space side by side with pictures which are, in fact, nothing more than testimonies to the excellence of the optician, cabinet-maker, and collodion manufacturer, and whose only merit consists in being pretty.

The exhibition opened to the public on Saturday last, the private view being held on the preceding day. Compared with the last exhibition, it is infinitely superior to it; but compared with that held at the South Kensington museum, it is inferior both in quantity and quality. Perhaps nothing so forcibly illustrates our opening remarks on the neglect of scientific photography as the case of M. Burnet, who has a series of pictures illustrative of new, and probably important processes—the "cuprotype" and "uranium" processes. There is more real intellect required for the production of pictures of this kind than for all the other pictures in the exhibition put together. Number 384 is a specimen of the cuprotype process, no silver being employed. The photograph is not first-rate, but in it we see promise of future success. Numbers 385, 386, 387 are by the uranium process, and are admirable specimens of the capabilities of this new branch of printing. Number 388 is on a paper prepared by fluoride of uranium, and developed by ferri-cyanide of potassium; it is a picture of a bas relief; in it there is almost everything that could be desired as far as regards the rendering of half tints and clear detail: indeed, the whole of this series cannot prove otherwise than interesting to the scientific photographer. For our own part, we would rather see these crude attempts than the whole room full of mere pretty pictures; and more fully to show the justice of our preliminary remarks, we find these important prints huddled close to the ground in an out-of-the-way corner of one of the small rooms, and, what is worse still, without a single line of description in the catalogue. So that, unless the spectator has unusually sharp eye-sight, he would in all probability miss seeing them, and the casual visitor would only pass them by as very bad pictures, never for a moment reflecting on the importance of such discoveries as these to future photography.

The leading pictures in the collection are the reproduction of the cartoons of Raffaelle at Hampton Court, by Caldesi and Montecchi, and by C. Thurston Thompson, for the department of science and art at South Kensington. The

thanks of the photographic and artistic world are due to the former gentlemen for the enterprising manner in which they have placed before us such an excellent series of the reproductions of great masters, both ancient and modern.

We understand that this undertaking has for many years been a long-cherished idea of this firm, and it has only been by great perseverance that they have overcome obstacles which seemed almost insurmountable. In their first application to her Majesty's government—which took place six years ago—for permission to copy these great works, they were not successful, as the government of the day was afraid that, in the removal necessary for photographic copying, they might possibly get so damaged as to deteriorate their value, which, we need hardly say, would be a national loss. However, they pushed their suit with succeeding governments, and the result is the series before us. We may mention incidentally that, in the necessary removal of these cartoons, happily they did not receive the slightest injury. But the preservation of the originals will be a matter of less actual importance now we have such admirable transcripts as these. No doubt her Majesty's government were induced the more readily to grant permission to photograph these cartoons, from the very importance of the subject, because it must be apparent to everybody, that the object to be gained was in every way worth the risk incurred in copying the cartoons, as the originals are in a most dilapidated state. They were cut in several places as guides for the Flemish weavers, and afterwards pasted together; but owing to their great age they are gradually becoming more indistinct; so much so that they are now to be placed under glass, from which they cannot in future be removed. When works of such importance are decaying, nothing could be more opportune than photography to redeem them from oblivion, with a fidelity far beyond any other mode of transcription. Perhaps there is scarcely any set of pictures so well known, and yet, at the same time, in such request. There have been copies innumerable taken of these cartoons, from the plain wood engraving, and cheap coloured lithograph, which have adorned the walls of the village school; or the still more elaborate etchings which are used to illustrate the "Diamond Testament." Who does not remember the picture of "Paul preaching at Athens," or "Our Saviour's Charge to Peter," or "The Miraculous Draught"? We should think that there is scarcely a reader of the "Photographic News" who is not acquainted with these pictures. They have been engraved many times; but the engravings will by no means bear comparison with the photographic copies.

We might enter at length into the comparative merits of engraving and photography; but that would demand more space than we have at command: however, we shall in a future number revert to the question. The whole series of photographs is much more interesting to us than the great faded originals; for, by means of photography, we have them reduced to a plain black and white tint, whereas, in the originals, there is such a feeble colouring, that it is rather painful than otherwise. Every one of these copies is distinct and clear; and what in the originals appears misty and confused, is striking in these. There is a great nicety of half tint, which is more perceptible than in the case even of a highly-finished picture. This is attributable to the absence of that combination of colouring, which is often the picture-copyist's bane, as we pointed out in vol. i. p. 61. It would be almost superfluous to select any one of these pictures, as there is, so to speak, a photographic sameness in them. There appears a great uniformity in the negatives —a point of importance to those who are desirous of having a set of the seven, as it is at all times desirable to have the photographs of a series as much of a tint as possible. Of course the size of the photographs varies according to the proportions of the original cartoons. There are four sizes of cartoons: the largest is forty-four inches by twenty-eight inches. This is taken in two pieces, and joined in the middle. The joining is not perceptible, inasmuch as there are several joinings in the originals which show strongly in the copies; and, as we remarked before, the uniformity of the negatives as regards colour enables the mounter to join them in such a manner as to render it impossible, except upon close inspection, to detect the juncture. This is an important feature in all large photographs where joinings have to be made.

To artists and connoisseurs, perhaps, the most interesting thing will be the studies of the principal heads and figures in the cartoons. For the use of those who may wish to study the forms of Raphael in detail, and to art collectors, these will prove invaluable, as, by this means, they will be enabled to see in detail the important portions of these cartoons. It will be seen, on comparing the sizes, that these are on a large scale, and we may state that each head is about eighteen inches by fifteen, while the whole picture of the middle size, which is a large photograph, is only twenty-nine inches by eighteen. We have heard of an ecclesiastical dignitary of the Roman Catholic Church who is an eminent art connoisseur, and who has so studied the works of this great artist, that he can take a magnifying glass and go over one of his masterpieces, and point out where Raphael has laid on his brush, and where his pupils have painted. These studies would enable any such microscopic admirers of the great Italian to pursue *ad libitum* such observations.

After the photographs of the Raffaelle Cartoons, perhaps the next most important picture in the collection is the large view of the Crystal Palace by P. H. Delamotte (169). It is in three pieces, and is taken from the central nave. The effect is very fine, as there is great uniformity in the tone of the picture; and the play of the shadows, as they appear here and there through the picture, is very pleasing; the detail of the foliage is also good. In some instances, however, the perspective is bad; and the three pictures, which are here united into one, should have been taken from the *same* spot, by merely rotating the camera on its axis, and not from *different* places. Had this been done, the effect would have been perfect. One thing we particularly admire in connection with this picture, is, the candour with which the photographer states all the means employed to obtain such a pleasing result. The names of the manufacturer of the collodion, and the maker of the lens, are here made as prominent as that of the manipulator. We should like to see this plan adopted in all cases, as very valuable information would frequently be thereby afforded.

(To be continued.)

THE MOLECULAR ACTION OF CRYSTALLINE PARTICLES.*

BY DR. A. WELLER.

A few days' stay at the convent of St. Bernard gave me an opportunity of repeating the observation on the clouds as mentioned by De Saussure, which may be also made at this season on our London fogs: globules of various sizes in these circumstances are frequently discerned by the naked eye floating in all directions. I have endeavoured to ascertain their vesicular structure, but have been unable to do so from direct observations. It is frequently a most difficult point, in microscopic investigation, to decide upon the existence of a thin transparent membrane; it is still more so to pronounce upon the vesicular or spherular structure of globules in constant agitation; and I believe that if minute spherules and vesicles could be mixed together, we do not possess any means at present of distinguishing them. I have never been able to detect that appearance of bursting of the globules mentioned by De Saussure, but sometimes, when the agitation of the air is slight, two of the larger globules may be seen floating towards each other, and afterwards disappearing suddenly, which may be explained, if we

* Continued from page 207.

admit that this bursting is caused by the union of the two spherules into one, which is too heavy to remain any longer in suspension, and whose rapid decomposition conceals it from the sight. There may be urged as objections to the vesicular theory that, if the pellicle became extremely thin, the vesicle would no longer be perceived any more than the apex of an air bubble before bursting, or the central black spot of a system of Newton's coloured rings. It will be seen below, that the globules of vapour possess the power of depositing themselves in a crystalline form, which requires a tranquil deposition of particles, such as could scarcely be deemed possible if the air contained in each had to escape at the moment of its crystallisation. I have endeavoured to fix the globules of water on glass and other substances, so as to be enabled to submit them to microscopic inspection; but, from their volatile nature and other causes, I have not succeeded: however, it is easy to do so with almost any other volatile substance; and I have examined several in this way without detecting the slightest appearance of a vesicular structure. Mercury is deposited under the form of globular particles, with a metallic lustre, whose diameter is 1·500th of a millimètre, in which I have never detected any internal cavity by the most careful examination. Flour of sulphur is found to consist of solid globules, several of which adhere together; when acted upon by a gentle solvent their external portion is dissolved, and there remains a regular octahedron. An interesting experiment may be made on the fumes of sal-ammoniac, which appears whenever muriatic acid and ammonia are brought together. Two small phials, each containing one of these substances, are covered by an inverted tumbler; above the surface of the acid are seen, at a short distance, the fumes of the salt, which, at the end of a few hours, are found to be condensed into a thin snowy pellicle, completely obstructing the mouth of the bottle. This partition is so delicate, that the slightest agitation will cause it to fall into the liquid. In all these cases it is found, that the fumes possess the power of remaining suspended a greater length of time than would be expected from the difference of their specific gravity with that of air, which is also the case with the fumes of other substances, and smoke in particular. This can only be accounted for by the continual state of agitation of the air, even within an enclosed space, and by the elasticity of the solid and liquid particles. In the case of solid particles this can be readily admitted, but with regard to liquid globules, there is probably some action similar to that which takes place on the impinging of solid elastic balls, which, after becoming flattened, rebound on account of their tendency to recover their original shape. The causes which act in fixing different vapours and fumes are the same as those which determine the precipitation of solid particles in solution; such as, for instance, sharp points of any kind, minute filaments, and, more especially, the existence of a crystalline particle to act as a nucleus. Non-conducting substances, as woollen cloth, the nap of a hat, the web of a spider, &c., are covered with aqueous globules when no rain has fallen, and when polished surfaces near present no such deposition.

Having now shown the existence of a crystalline power in vapours, we shall proceed to prove the influence of a force which disturbs the equilibrium in the same manner as in the saline solutions above mentioned. The friction of a solid body on glass will leave traces which are invisible until breathed upon. Many bodies possess this property, but the mineral steatites or soapstone produces the effect better than any other I know. A considerable degree of friction may be used over the traces thus produced by steatites, without affecting the appearance of the traces when breathed upon repeatedly. The glass may even be heated considerably without affecting them. By examining with the microscope the parts which have been traced upon by steatite, we are unable any more than with the naked eye to detect any material cause for the deposition of vapours in these places, as it probably depends upon the transparency of the mineral which, being so attenuated, is unable to affect the rays of light. When the traces have been brought out by breathing upon them, they must be covered by another piece of glass, which impedes the evaporation of the water, and allows them to be submitted to the microscope. The parts untouched by the steatite present the appearances that have been already mentioned. On the lines created by the mineral the drops of water are differently disposed, their long diameters being parallel to the direction of the lines. These minute drops very much resemble the globules of gas deposited from a liquid; the only difference between the two consisting in the deviation from the globular form in the liquid traces, which evidently arises from the power which the water possesses in wetting the glass. It is evident, therefore, that the secondary cause of these images is, a difference in the position of the minute drops of water, reflecting the light differently from the other drops which are irregularly disposed on the other parts of the glass. There exists another method of fixing vapours which has been long known, and to which, I believe, attention was first directed by Professor Draper. It consists merely in placing a body upon a plain surface, such as that of a metallic speculum, or even of glass; after a short time it is found that simple contact such as this has caused some molecular action, as the spot occupied by the object will become apparent by breathing on it in the same way as with the images of a steatite. This observation is the more interesting, as it serves as a connecting link between the effects of mechanical power, and those caused by other agents. The experiments of Mr. Hunt have shown the influence of heat in causing the fixation of vapours. An image of this sort formed on glass by the breath, when examined under the microscope, presents exactly the same appearance as that formed by steatite. The same difficulty is experienced in bringing out, by means of mercurial vapours, the thermographic images on glass, as is found with the traces of steatite, which possess, in a very slight degree, the power of fixing mercurial vapours. It appears, therefore, that the power that water has of wetting glass, causes it to have a greater tendency to deposit than mercury, which does not wet glass. The cause of the production of thermographic images is evidently similar to that which causes the deposition of a solid body from the solution.

(To be continued.)

OF THE CHEMICAL INFLUENCE OF LIGHT ON CERTAIN BODIES.

BY M. E. CHEVREUL.

THE following was read at a recent meeting of the *Académie des Sciences* by one of its most distinguished members—M. Chevreul:—

The numerous researches which have been made into the action of light on substances, from a chemical point of view, have induced me to think that a note added to the last two papers of M. Nièpce de St. Victor, for the purpose of establishing that which is new, and pointing out the question to which they lead, would not be wanting in interest.

It is important, first of all, to signalise two circumstances in the chemical action of the light; 1. that when, acting alone, it decomposes a body or operates the combination of two bodies; 2. that, when it acts concurrently with a body on a complex body. This distinction is perfectly justified by the following facts:—

Of light acting alone, either to decompose a body, or to combine two bodies.

1. Auric acid exposed to light in a vacuum is reduced to gold and oxygen gas.

2. Prussian blue, under the same circumstances, loses its blue colour in losing its cyanogen; but the separation of the cyanogen is not complete, like that of the oxygen from the auric acid. However this may be, the light acts in these two cases, as a reagent in eliminating the electro-negative from the electro-positive body.

3. The light of the sun determines the instantaneous union of chlorine with hydrogen.

Light acts concurrently with a body on a complex body.

If, relying on previous statements, we adopted the generally received opinion, that light alone suffices to alter a great number of coloured substances, notably a great many of those stuffs which are dyed, we should deceive ourselves greatly; for the researches which have occupied me more than ten years, and the results of which are recorded in the *Memoires de l'Académie*, incontestably prove that the greater part of the alterations of which I speak arise, not from the action of the light alone, but from the simultaneous action of light, oxygen, and the vapour of the atmosphere, in such a way that dyed stuff, alterable in the air under the influence of the sun, would not have altered in the same time if it had been exposed, on the one hand, to the air in a dark place, or, on the other hand, in the luminous vacuum.

1. (*a*) Archil, turmeric, anatto, &c., &c., resist the action of the light in a vacuum:

(*b*) They resist the air in obscurity:

(*c*) But they are altered if, exposed to the oxygen of the atmosphere, they receive at the same time the action of the light.

2. Colourless organic matters, under circumstances in which coloured organic matters change, do not resist the causes of the alteration of the latter. I may cite, in support of this, the example of the destruction of the gelatine size of the paper, mentioned by me in 1837, and again by M. Nièpce de St. Victor, in his last paper *apropos* of the starch size, a destruction which is much more rapid than that of the gelatine.

I have found that, under the influence of light, cotton enclosed in confined air with baryta water, though not in contact, changed with the production of carbonic acid gas.

Chlorine water used in bleaching attacks colourless as well as coloured substances, and, for this reason, I have regarded bleaching differently to what it had been previously.

3. I demonstrated the influence which the stuff exercises on the stability of different colouring principles therein fixed.

Anatto is more stable on cotton and silk than it is on wool.

Archil is more stable on silk than it is on wool and cotton.

Sulpho-indigotic acid is more stable on silk than on wool and cotton.

In dry air, on the contrary, indigo is more stable on wool than on silk.

I have verified the effect of a screen in preventing the influence of the light on a body exposed to the air. I have shown how the intervention of a glass weakened the action of the light on coloured objects. I may mention here the following experiment:—A white design on the border of a curtain, the ground being of indigo, allowed the light to pass through it, and, consequently, with the oxygen of the atmosphere, to reproduce itself by eating into the indigo colour of the curtain, while the coloured ground of the border prevented the transmission of white light, and thus preserved the colour of the part of the curtain immediately beneath it.

I recall this example, because the result of the experiment was laid before the Academy on the 2nd of January, 1837, that is to say, before Daguerre communicated to the Academy, through Arago, the photographic processes he published under the joint names of himself and Nicéphore Nièpce. I may mention an example of a similar kind, which has been communicated to me by M. Herlemont, *communal instituteur* at Gentilly. A document printed in a bistre colour on a white ground chanced to be exposed to the light, having beneath it a rose-coloured paper. That which happened in my experiment was repeated in this instance with perfect distinctness. It is evident that the document in this case acted the part of the negative of which we hear so much now-a-days in photographic processes. It was the experiment published on the 2nd of January, 1837, which led me to show that in the process of M. Nicéphore Nièpce, in which a metallic plate covered with a layer of bitumen of Judea received the contact of the light in a camera, the image developed is an effect that the oxygen of the atmosphere exercises, under the influence of light, on bitumen. In consequence of this action, the insolated bitumen having become insoluble, it is possible, by means of solvents, such as naphtha, oil of lavender, &c., to remove from the plate the non-insolated bitumen, and thus obtain the image traced in insoluble bitumen.

According to the preceding, two classes of phenomena are produced by light alone, or with its assistance, in the actions that we term chemical.

1. It acts alone, and produces in the vacuum either a radical decomposition like that of auric acid, or partial as in the case of the Prussian blue, or a combination like that of chlorine with hydrogen.

2. It acts on one or several bodies with the assistance of a gas; for example, with that of gaseous oxygen, or dry or humid coloured substances.

(*To be continued.*)

GENERAL OBSERVATIONS ON PHOTOGRAPHIC POSITIVE PROOFS.*

BY MM. DAVANNE AND A. GIRARD.

ON SENSITISING—(*continued*).

Of the Influence of the Strength of the Bath—(*continued*).—When the nitrate is mixed with the chloride, the effect of the rays is no longer the same. The first of these salts retards, in fact, the action on the second, which explains the retardation in the appearance of the proof; but, besides the chloride, which reduces itself, it forms immediately a new quantity that the light may attack, because before, in the condition of a nitrate, it occupied a proper place, and, consequently, now in the state of chloride it is not yet covered by a film of reduced silver; hence, in a given thickness, there is a greater quantity of chloride of silver, consequently of reduced silver, and, consequently, a greater intensity.

Beyond this, in the case of albumenised papers, another cause intervenes; the albuminate of silver, which also possesses the property of being impressionable under the luminous action, brings to the *ensemble* the vigour and colouring which characterise it.

It does not follow from this that a sheet of paper impregnated with nitrate of silver alone—an albumenised sheet especially—cannot give a proof. We will take this fact into consideration when we come to the subject of insolation.

This first fact established, let us consider the red colouring that proofs present, with the greater intensity in proportion as the quantity of silver they contain is less. Our preceding researches on the action of the sizings, will assist us in explaining this.

We have shown that the more abundant the sizing, proportionally to a quantity of silver, the redder the proof. Now these two elements—silver and size—being brought in the presence of each other, the size being augmented, or the silver diminished, the result will be evidently the same. We had on our first sheet a certain quantity of size, plus 0·467 grammes of silver; on the third we had the same quantity of size, plus 0·876 grammes of silver, almost double the former quantity. In the first, what happened? The greater part of the silver combined with the size, and, consequently, the proof assumed the tone with which we are familiar; in the third, on the contrary, the silver being in too great abundance for the size present to be able to satisfy the combination, the result was a certain quantity of uncombined silver, which communicated to the *ensemble* a little of the black tint which characterises proofs obtained on paper without size.

Let us recall here that these results agree with that we

* Continued from p. 206.

have already established for the variation in the quantities of chloride. We have demonstrated, in fact, that, in a given paper, the less chloride there was (within a certain limit) the redder the proof; and that when the proportion was augmented, the proof was more coloured, but quitted the red tones to assume black and opaque tones. Now, the richer a sheet is in salt, the richer it becomes in chloride by sensitising.

Thus, in this case also, one cannot advise one strength rather than another; one can only point out a medium—15 per cent.; but one may state, in an absolute manner, the influence which a greater or less richness of the silver bath will exercise. For soft negatives, giving habitually veiled positives, the bath ought to be more concentrated; for negatives furnishing vivid contrasts, it ought, on the contrary, to be more feeble. It is a sort of photographic palette in the hands of the artist; it is for him to know how to employ the tones, according to the exigencies of his negative.

The results we have announced will maintain themselves in a constant manner if the silver bath prepared in the given conditions be retained at a constant richness. But all photographers know with what rapidity the value of the paper prepared successively on the same bath decreases, and all have seen that this rapid decrease arose, in great part at least, from a diminution of this richness.

Analysis fully confirms this view, and shows that, in preparing even a limited number of sheets in the same bath, the bath is not deprived merely of a quantity of silver proportionate to that of the vanished liquid, but of a quantity much more considerable.

When a sheet is placed on the bath, the nitrate that this contains finds itself in presence of three distinct elements:—the fibre of the paper itself, the salt previously introduced into it, and the size with which it is covered. Let us examine in succession the influence of each of these elements; and let us mention, now, that the results we are about to announce—general in their principle, *the impoverishment of the bath*, become variable in their relative proportions according to the nature of the product employed, and cannot, consequently, be explained in absolute values.

In all the assays which follow—and to put ourselves in as general a position as possible, we employed papers of the same make—we ascertained that a salted and albumenised sheet of paper measuring 44×57, submitted to a bath of 15 per cent., formed of 100 cubic centimètres only, took up only 8 cubic centimètres of liquid on an average, and 3·76 grammes of nitrate of silver. Now, according to the strength of the bath, these 8 cubic centimètres ought to have contained only 1·20 gramme of nitrate of silver; then $3{\cdot}76 - 1{\cdot}20 = 2{\cdot}56$ grammes, have been taken from the remaining liquid, and this, previously formed of 100 cubic centimètres of water and 15 grammes of silver, is now formed of 92 cubic centimètres of water and 11·24 grammes of nitrate, or, in other words, its richness has descended from 15 per cent. to $\frac{11{\cdot}24 \times 100}{92} = 12{\cdot}2$ per cent.

The rapid impoverishment of the bath is thus made evident, since one sheet alone of ordinary paper suffices to lower it from a bath of 15 per cent. to one of 12·2 per cent.

(*To be continued.*)

PHOTOGRAPHY IN CHINA.

THE old adage that "there is many a slip 'twixt the cup and the lip" has been unpleasantly realised in the case of Mr. R. Morrison. This gentleman was attached to Lord Elgin's embassy in China, and under circumstances of great difficulty—such as deteriorated chemicals, intense heat—the thermometer marking, in the coolest place that could be found, 96 degrees—he had obtained a number of interesting photographic negatives. Among these were included a general view of Tien-tsin, taken from the upper story of a temple; views of the river and the entrance to the grand canal; of the Joss-House, which was the residence of the English and French embassies; as well as of the building in which the treaties were signed, called "The Temple of the Winds." It will be seen that all these are subjects of great interest to the public, and it is with regret, therefore, that we announce that all these negatives, together with many others, were destroyed by an accident that befell a part of the ambassadorial baggage.

It is possible that by a little manœuvring pictures may still be obtained from some of these negatives; and, indeed, we have seen one, "The imperial commissioners, Kweiliang and Hwashana," which, though it shows signs of having been "touched," which are visible enough to the eye of a photographer, is a photograph of great merit, the faces being alive with expression, and possessing an individuality which at once stamps them as portraits.

There was one peculiar difficulty which Mr. Morrison had to encounter beyond those we have mentioned, and which was not incident on the deterioration of the chemicals, and this arose from the variableness in the quality of the light; the actinic rays, which were strong enough to give a good picture in a given time under certain circumstances, being so much strengthened or weakened in the short time necessary for preparing another plate, that he frequently found that the second picture was under or over exposed, and this notwithstanding that all the other conditions were precisely the same.

Critical Notices.

Curiosities of Science. By J. TIMBS. London: Kent & Co.

WE think that nobody will be inclined to disagree with us when we say, that if there is anything which is "not generally known," Mr. Timbs is the gentleman to whom we can refer, with all confidence, for an explanation of it—inasmuch as he has apparently made it a life study to acquire that knowledge of incidents and facts which are not patent to the world. The arduous task of obtaining correct information respecting common errors, is one which requires no little amount of tact and observation. It would be difficult to mention any one who is so capable of following this pursuit as the author of "Curiosities of Science." Mr. Timbs seems to be a kind of standard reference library, with catalogue included, to which we may go and gather old facts and forgotten truths. A fact is stated in a terse, laconic, and concise manner, yet, at the same time, sufficiently copious to treat the subject fairly. Some facts, related by him in a paragraph, we have seen spun out by others to a small book; yet, amid all the redundancy of language used, it has failed to give as clear a definition of what was attempted to be explained as we have here in a few lines. This work is one which the scientific reader will hail with delight, for here he will find many important facts which he may have forgotten; and certainly not one of the least important branches of knowledge is the retention of what we have read, if we are not possessed of good memories, or, at least, a common-place book which shall assist in recalling forgotten facts. This book cannot fail to be of the greatest value to a scientific reader; but valuable as it may be to that class of readers, it will be equally, if not more so, to those ignorant of more than the first principles of science: since the information here selected is not merely abstruse reasoning or dry facts, but is frequently interspersed with many interesting and instructive anecdotes. Of course the part of the work which most nearly concerns us is the photographic portion, and we are sorry that, in this department, there is such comparative paucity; for it must be apparent, that within the last few years a number of new and highly important facts have been brought to light in connection with photography which ought to have found a place in this volume. We do not write these remarks in any hypercritical spirit. We do not wish to see a history of photography inserted, because that would not be in keeping with the plan of the

author. What we wish is, that some of the more important facts connected with the heliographic art should find a place here. It will be seen by the most unobservant that, in the present state of scientific advancement, there are many important facts daily coming to light, and, thus discretion would be required to see that the selection should be one which would not only be scientifically, but also generally interesting. In the former the author has succeeded admirably, and, at the same time, he has not been unmindful in the latter. The extract on "The Art of Observation," from the *North British Review*, strikes us as being a fair exemplification of the talent of selection which Mr. Timbs displays to the fullest extent. It says:—"To observe properly, in the very simplest of the physical sciences, requires a long and severe training. No one knows this so well as the great discoverer, Faraday, who once said, that he always doubted his own observations. Mitscherlick, on one occasion, remarked to a man of science, that it took fourteen years to discover and establish a single new fact in chemistry. An enthusiastic student one day betook himself to Baron Cuvier, with the exhibition of a new organ—a muscle, which he supposed himself to have discovered in the body of some living creature or other; but the experienced and sagacious naturalist kindly bade the young man return to him with the same discovery in six months. The Baron would not even listen to the student's demonstration, nor examine his dissection, till the eager and youthful discoverer had hung over the object of inquiry for half a year, and yet that object was a mere thing of the senses." Would that some of our enthusiastic new process discoverers had been brought up in this school!

Lessons on Colouring Photographs.

COLOURING POSITIVES ON GLASS—(*continued.*)

Landscape Backgrounds.—The natural background of the photograph should be of a similar gray to that described in our last lesson. If it be too dark, it is difficult to cover evenly and smoothly with blue so as to secure a clear, bright sky; and if it be too light, the landscape will be flat and tame. To explain the last remark, we may here state, that all the shadows in the landscape are obtained by leaving untouched the dark gray of the background, the lights and half lights being painted on.

Some knowledge of drawing is absolutely necessary for success here; for although any elaborate attempt at design or composition would be out of place, yet, as distance and foreground must be indicated by some kind of form, and as clouds, even, must have some shape, a little skill in drawing, however slight, is necessary as a preliminary acquisition. Unless a large extent of background is to be covered, very little need be attempted beyond a sky; but let it be remembered that the proximity of blue is rarely favourable to any complexion but a very fair one. If a landscape background be desired where the sitter has a sallow complexion, the general tone of the sky may be kept somewhat gray and cloudy, a little bright blue only breaking in at the zenith.

It is impossible to give any very detailed directions as to the effects to be produced, so much depends on the picture to be coloured, and on the taste of the artist. We can only give here, as we have done before, one illustration which will serve as a general indication of the method to be pursued. We will suppose a landscape with evening sky and glowing sunset is to be attempted. Commence at the horizon, making it about one-third from the bottom of the plate. The tint labelled "horizon" must be used to trace the distant outline of the landscape, which should be of an irregular, undulating character; a few streaks of this tint intermingled with carmine, or carmine and flesh colour, form the lower part of the sky. A good effect is often produced by thus repeating the flesh tint in the background; but remember that the tint in the background should never be so pure or brilliant as that in the face. These colours may merge into various tints of blue, lavender, or gray, and these again into a bright, clear sky-blue. The sky may be broken with clouds, according to the fancy of the colorist, whose taste must also decide their colour, size, and shape. It must be remembered, however, that, whatever be their colour, they must be something more than flat patches; they must possess light and shadow to give them relief and form. Some colorists leave spaces untouched by the blue, in which the clouds are subsequently coloured. We find it a simpler plan, and one presenting no difficulties of manipulation, to colour them upon the blue without leaving such spaces. The lighted edge may be well defined with "silver gray;" this edge should not be smooth or soft, but generally somewhat ragged or abrupt, and should sometimes have an irregular, fleecy effect. For the shadowed portion use dark gray, or dark gray and lavender, into which the blue of the sky may gradually merge, which will give a partially transparent vapoury effect; unless some care be taken to produce this effect, the clouds may easily be made to look like so many irregular-shaped pieces of rock jutting out from the sky. The clouds near the horizon, in the sky we are describing, should be of a warmer tint, using flesh tints, or those mixed with yellow for the lights, and warm gray and purple for the shadows.

The extreme distance of the landscape where it joins the horizon, may be coloured with a bluish gray, or with the bluish green tint labelled "distance," warmer greens, browns, and yellows being used as the landscape advances towards the foreground, to which, of course, more marked definition of form will be given. Very sharp or detailed drawing, however, is not required in any portion of a background, as even the most advancing points are supposed to be some distance behind the figure, and general effects rather than definite forms are required, the idea of distance and atmosphere as much as possible pervading the whole. If a large space of background is to be covered, some variety of form and colour should be attempted. Water may be coloured with dark blue, the light on its surface with white or silver gray.

The colorist ambitious of producing architectural effects, as columns, balustrades, &c., may easily do so, if he possess sufficient skill in drawing, by using light grays or browns, or these with a little yellow, for the lights and half lights, leaving the plate untouched for the deep shadows. Let him be careful, however, to preserve some keeping in his effects, and see that, in colouring a column, for instance, his base, shaft, and capital belong to each other. Drapery may be managed in the same way, taking care that the drawing of the folds resembles as nearly as possible that of the fabric to be imitated. As we have before stated, however, as a general rule, a more simple and chaste effect is obtained by avoiding the crowding into the background of objects having no connection with the subject.

(*To be continued.*)

Photographic Chemistry.

ORGANIC CHEMISTRY—(*continued*).

AMONG organic bodies is one which is of very great interest to photographers, and is likely to retain its importance in their estimation, in spite of all the various substances that are proposed as substitutes for it; this substance is *albumen*. At ordinary temperatures it is soluble in water, but if the temperature be increased to about 150° it becomes a solid; and this change may likewise be produced without the aid of heat by the action of alcohol, creosote, and the greater part of the acids and the metallic salts. This property has induced some photographers to employ it in the preparation of plates for photographic purposes, &c., to which we shall refer more in detail in a future number.

CHEMICAL MANIPULATIONS.

The principal chemical manipulations in photography are comprised in *dissolving*, *filtering*, and *crystallising*, In all these operations it is advisable, as far as possible. to employ utensils made of glass or porcelain; the greater number of substances used in the laboratory containing free acids, or metals in solution, which would either attack metal vessels, or be themselves contaminated. Gutta percha vessels are available for many of these operations, but they have the drawbacks of being altered in shape by heat, of being acted upon, and even dissolved, by essences, and moreover, from being badly prepared, or subjected to a too prolonged desiccation, they become brittle, or otherwise unfit for use. The number of utensils that are absolutely indispensable to the carrying out of these manipulations is not large; a few funnels of different sizes, some flat-bottomed glasses for precipitating, some stoppered bottles for holding solutions, some dishes or basins, and some small porcelain capsules.

Of Solutions.—That which is generally understood by the expression *to dissolve a body* is, the causing it to disappear in a liquid which does not alter its chemical composition. For example, sugar is a solid which dissolves in water, and communicates to the water a sweet taste; but though the sugar has become invisible it is present, unaltered, in the liquid, as may readily be proved by evaporating this liquid, when the sugar will be found left in the form of crystals. Water also dissolves nitric acid, which is a liquid, and hydrochloric acid, which is of a gaseous nature, to form homogeneous liquids, which have the properties of the bodies it holds in solution.

When a liquid has dissolved as great a portion of any substance as it is capable of dissolving, it is said to be *saturated*, that is to say, that if the saturating substance were suffered to remain in the water for any length of time, no more of it would be dissolved. Generally, a liquid possesses a greater capacity for dissolving substances when heated than when cold; it also saturates itself with greater rapidity.

Filtration.—When a body is partially dissolved, it is often advisable to filter the solution to separate substances in suspension; it is thus rendered perfectly clear, the undissolved particles being held back by the paper of which the filter is composed, this paper being what is usually termed blotting paper, that is, paper which has been made without size. This paper is of different colours, and may, any of it, be employed in filtering; but we advise the use of the white only, that being made of cleaner materials than the coloured papers.

The mode of making these filters is easy enough. Take a square or round piece of blotting paper, fold it in half, and then in half again, the lines of the fold passing through the centre of the paper. Upon now opening the folded paper so that three thicknesses come on the one side, and one on the other, a cone-shaped filter will be obtained. This is then placed in the funnel, the sides pressed closely together, and the liquid poured in. There are other methods of making filters, but the above will generally be found effectual; but in cases where the paper would be attacked by the liquid undergoing the process of filtration, as, for instance, in filtering nitric acid, in this case it is necessary to substitute a bit of tow, or a pellet of asbestos, which is pushed lightly into the neck of the funnel.

(To be continued.)

Dictionary of Photography.

AMBER.—A fossil substance, which has many of the characters of a resin. It is a light yellow transparent substance, of a slightly greater density than water. It has the property of becoming very electrical by friction. Amber consists of a mixture of several resinous bodies. It has been used in photography for the purpose of preparing a varnish for negatives; but it is not of much value owing to its liability to scratch. The mode of preparing amber varnish has been fully described in the "PHOTOGRAPHIC NEWS," vol. i. p. 144.

AMBROTYPE.—A name given in America to positives on glass, or other transparent medium, in which the whites are composed of the metallic deposit, and the dark parts are obtained by placing black varnish, or other substance, behind the picture.

AMMONIA.—An alkali, which is gaseous in its uncombined state, and is combined of 3 equivalents of hydrogen and 1 of nitrogen. It is often called *volatile alkali.* It possesses great pungency and powerful alkaline properties. Water readily absorbs about 500 times its volume, and in this state forms strong liquid ammonia, which, when much more diluted, is popularly known as spirits of hartshorn. As usually met with, in the form of a crystalline whitish mass, commonly called smelling salts, it is combined with carbonic acid and water, forming a sesqui-carbonate of ammonia. It is easily recognised by its pungent odour, changing vegetable blues into green, and by producing dense white fumes when brought in contact with the vapour of hydrochloric acid. Ammonia enters largely into the photographic processes. In the daguerreotype process it is exceedingly useful—in a diluted state (say 1 part liquid ammonia to 18 of water) for cleaning the plate. Ammonia, in combination with various salts of iron, silver, &c., has been employed for paper and glass photographs. Ammonia readily dissolves chloride of silver; it has, therefore, been proposed by Le Gray for fixing positive proofs. He states that very agreeable red tints may be thus obtained, and these may be brought back to the black colour by gallic acid, and then fixed definitely by washing the proof in several waters.

AMMONIO-CITRATE OF IRON.—A combination of citric acid and ammonia with iron, &c. It is obtained by dissolving pure iron filings in citrate of ammonia. When the filings are reduced to one-half, add a little water; filter and evaporate to dryness. Papers washed with this compound, and developed with various re-agents, are of great sensibility, and give pictures of great depth and sharpness, but they often spontaneously darken, and become eventually obliterated.

AMMONIO-NITRATE OF IRON.—Iron in combination with ammonia and nitric acid—little used in the art, and of little importance.

AMMONIO-NITRATE OF SILVER.—A compound, consisting of ammonia, silver, and nitric acid; employed as a sensitive wash for paper. The solution is made by dissolving 1 part of nitrate of silver in 12 of distilled water, and gradually adding strong liquid ammonia, until the precipitate first produced is again nearly dissolved. This solution is applied to salted paper—previously stretched on a board a little larger than itself—with a brush, evenly, smoothly, and thoroughly. When the paper is completely wetted, let it dry. Then place the negative paper to be copied, with its back uppermost, upon the sensitive side of the prepared paper, and press it close by means of a plate of glass, and expose it to the sun. The exposed parts of the paper soon change to a slaty-blue, deepening towards black. When the picture is fully developed, it should be washed in rain-water, dried off with bibulous paper, and immersed in a solution of hyposulphite of soda—1 ounce of the salt to a quart of water. Let it soak for some time and occasionally agitate it; take it out again; wash with warm water; and thoroughly dry with bibulous paper and exposure to the air. Some photographers consider this the best and most economical photographic paper.

AMMONIO-TARTRATE OF IRON—Is composed of 1 part tartaric acid, 3 parts iron filings, digested for two or three days in a sufficient quantity of hot water to barely cover the mixture, frequently stirring it, and with an addition of liquor ammoniæ; dilute with water; decant; wash the undissolved portion of iron; filter the mixed liquors; and evaporate to dryness. This substance is used in a similar way to the ammonio-citrate of iron.

(To be continued.)

A Catechism of Photography.

APPLICATION OF THE COLLODION.

Q. How is the plate to be held while the collodion is applied?

A. When the glass is perfectly clean, the collodion must be applied so as to insure a perfectly even film over the whole of the surface. This operation demands some practice. If the plate be not too large, it may be supported on the ends of the thumb and fingers of the left hand. There is also an instrument called the pneumatic plate-holder, used by some photographers. A piece of india-rubber is sometimes attached to the back of the plate as a sort of handle; but the best and safest mode, when practicable, is to hold it by one corner by the thumb and fingers.

Q. How is the collodion to be applied?

A. While the glass plate is held in a perfectly horizontal position in the left hand, the collodion is to be poured into the centre with the right. As soon as the collodion has settled clearly and evenly over the whole surface, the plate may be tilted so as to allow the excess of collodion to flow back into the bottle from one corner; after which, the plate must be again held vertically, and oscillated from left to right, and from right to left, in order to obtain a perfectly even coating.

Q. Does not the ether in the collodion evaporate when exposed to the air?

A. It does, and this fact induces many operators to perform the coating process in great haste; but it is much better to do it steadily, and submit to loss by evaporation, than to fail in obtaining an even film. A little good ether can at any time be added to the collodion.

EXCITING THE PLATE.

Q. What must be done in order to render the collodion surface sensitive to light?

A. It must be plunged into a solution of nitrate of silver. The liquid penetrates the collodion film, and the nitrate of silver is thus brought into immediate contact with the soluble iodide of cadmium, ammonium, &c., rendering the surface sensitive to the action of light.

Q. Of what is the exciting bath composed?

A. Of nitrate of silver and distilled water, in the following proportions:—

Nitrate of silver	10 drachms.
Distilled water	20 ounces.

Q. Is this the bath invariably employed?

A. No; there are some variations. For instance—iodide of silver, in the proportion of 7 grains, is occasionally added.

Q. What is the object of adding the iodide of silver?

A. The object of putting the iodide of silver is that the nitrate may be saturated with it, as the plates would otherwise be deprived of a certain portion.

Q. Is not alcohol or ether occasionally added?

A. Yes; but most photographers regard such additions as altogether useless, and therefore carefully avoid them. Everything connected with photography should be done as simply as possible; and any additions to solutions—which additions may be dispensed with—ought not on any account to be introduced.

Q. What quantity of solution should be made at once?

A. This must, of course, depend on circumstances, but it rests chiefly on the form of the trough or bath which is employed, and also upon the size of the plate.

Q. What is the chief difference between the baths?

A. Some of them are vertical, and others horizontal. With the former a glass dipper is provided, upon which the plate rests, and which prevents the necessity of any handle, or of the fingers going into the liquid. With the horizontal bath a piece of india-rubber is usually attached to the back of the plate as a handle whilst applying the collodion, and to keep the fingers from the solution while dipping in the bath; but in either case there must be a sufficient quantity of the sensitive mixture in the bath to allow of the plate's immersion.

Q. For how long a time must the plate be immersed?

A. It must be immersed for a sufficient time to allow a free action of the sensitive solution on the surface. The temperature and composition of the collodion affect this very considerably; but, as a general rule, the plate must be submitted to the sensitive solution for from two to four minutes.

Q. Should the plate be allowed to remain quietly in the bath?

A. No; it should be lifted out of the liquid two or three times.

Q. Why?

A. By so doing the action is hastened, and a more even coating obtained.

Q. When the plate is rendered sufficiently sensitive, what is to be done?

A. The plate must be removed carefully from the solution, and as much as possible of the liquor be allowed to drain off.

Q. May it be allowed to dry?

A. No; the condition to be obtained is that of dampness without superfluous moisture.

Q. Thus prepared, is it exceedingly sensitive to the action of light?

A. It is, and every precaution is necessary to prevent any ray of daylight falling upon it. The sensitive solution must consequently be applied in a room chemically dark; this renders it difficult to take good collodion views in the open air—the use of a dark room being indispensable.

EXPOSURE IN THE CAMERA.

Q. How long must the plate be exposed in the camera?

A. The exposure of the plate in the camera must be determined by incidental circumstances. Much must depend on the intensity of the light; much on the nature of the subject to be taken. Practice can alone furnish a satisfactory reply to this difficult question; experience in this respect is the only safe teacher.

Q. How may we judge whether the plate has been exposed for too long or too short a time in the camera?

A. This is obvious on inspection. For instance—if on applying the developing mixture the shadows of the picture are brought out as rapidly as other parts, it is clear the plate has been too long in the camera; if, on the contrary, the picture is very slow in developing, and the shadows are scarcely brought out at all, it is evident the plate has not been long enough in the camera.

Q. What are the appearances in developing which indicate a good picture?

A. First, the appearance of all the brightest lights, and gradually the various shades, until at length the deepest shadows are brought out with all the strength and force of a sepia drawing.

(To be continued.)

Correspondence.

PAGES FROM THE NOTE-BOOK OF A TRAVELLING PHOTOGRAPHER.

BESIDES the objects mentioned in my last communication, there are at Bruges very numerous and beautiful, as well as curious specimens of architecture, which are well suited for pictures of a good size; while, if permission can be obtained to photograph them, there are various objects of interest in the churches and cathedral, which are admirably suited for stereoscopic pictures. In the cathedral, for instance, there are, among other things, a series of ornamental brasses, which are built into the wall, and are interesting specimens of Flemish art in the fifteenth and sixteenth centuries. The church of St. Jacques likewise

contains some monumental brasses. In the church of Notre Dame there is an elaborately carved wood pulpit, which is very well placed for the photographer: and in one of the chapels there is a statue of the Virgin and child, which is lattributed to Michel Angelo, respecting which the tradition runneth in Bruges, that it was being taken to England when the vessel containing it was wrecked on the coast of Flanders; and it is likewise said that Horace Walpole offered 30,000 florins for it. In common with a good many other valuable objects, during the continental war, it made a journey to Paris. In another of the chapels there are the tombs of Charles the Bold and his daughter Mary, the wife of the Emperor Maximilian. They are of great beauty; and on the top of them, on a slab of marble, are effigies in richly gilt copper of those who repose within. There will be some difficulty in getting pictures of these, as planks are placed along the railing to prevent anybody from looking into the chapel, a charge of half a franc is made for showing the contents; and I doubt whether the distance between the monuments and the wall of the chapel would be sufficient to allow the camera to be planted.

Views in the country of Belgium, whether of objects or landscapes, that are worth taking are so few and far between that it is seldom worth while to visit any other than the principal towns, which are connected by railway with each other; therefore, when I had exhausted Bruges, I packed up my apparatus and placed myself in the train and proceeded to Ghent. This city is far from being either as populous or as rich as at the period when Quentin Durward served Louis XI. of France, yet it is still a place of considerable trade, and manufactures a large quantity of cotton and other goods. The number of workmen employed in these manufactures is very considerable; and a custom is still in existence of ringing a bell three times a day, morning, noon, and evening, to summon the men to their work and meals. This was established about the year 1400, and people were cautioned to remain in-doors while it tolled, as well as to keep their children there, to prevent them from being trodden to death by the immense stream of workmen; vessels in the canals were brought to a stop at the drawbridges, which could not be raised so long as the sound of the bell could be heard. This city alone contains objects which would occupy the most industrious photographer many days to reproduce. I remained here three weeks, and, though far from being idle, I did not get all the pictures I wanted. The first which I took were of the four sides of the Vrijdags Market, a huge square, surrounded by ancient houses. It takes its name from the market being held in it every Friday. A good deal of historical interest attaches to this square; here the Counts of Flanders were installed with a pomp, which, if we may believe the Flemish chronicles, far exceeded anything of the kind seen at present; here the various guilds met to discuss their real or fancied grievances, and occasionally to settle a dispute between two guilds by force of arms; as at the time when Jaques Van Artevelde (the brewer, as he was called, from his having enrolled himself in that corporation, though himself a nobleman) took his stand here at the head of his faction, and fought a bloody battle with the fullers and those who supported them, so that the blood ran down the kennels like water after a heavy storm, and near fifteen hundred dead bodies were left lying on the ground. Worse scenes than these, however, were enacted here under the orders of the brutal Duke of Alva (whom it would require the peculiar talent of a good many Carlyles to whitewash and convert into a hero, though considering what Mr. Carlyle has recently done for the half-mad and wholly brutal Frederick, it is not impossible that it might be accomplished), who, during the religious persecutions he carried on in the Netherlands, caused fires to be lighted here, and many thousands of Protestants to be cast into them; so that the people who inhabited the houses were, at times, almost deafened by their agonising screams.

In a street, the name of which I forget, but it is quite close to this market, I took a picture of an enormous cannon, which is said to have been used by the men of Ghent, at the siege of Oudenarde, in 1382; it is made of wrought iron and hooped, and is about 18 feet long and 10½ in circumference.

Early one morning, I went to the Marché aux Poissons, and on my way home I passed along the Place St. Pharaïde, for the purpose of seeing if I could get a photograph of what is reckoned, I believe, the oldest building in Belgium, and which was once the residence of Edward III. and his family, and where his wife was delivered of a son, afterwards known as John of Ghent. I found very little of it left, but the next morning I got an interesting picture of the turreted gateway, interesting not on account of its architectural beauty, but from the historical reminiscences associated with it.

VIATOR.

WINTER DEVELOPERS.—PHOTOGRAPHIC QUACKERY.

To the Editor of "THE PHOTOGRAPHIC NEWS."

SIR,—Most photographers know that in cold winter weather, developing solutions should be warmed, and that the use of warm water for washing off is also advantageous. For out-door work, a test-tube and spirit lamp should be taken with the photographic apparatus, and the developer, being placed in the former, can in a few seconds be sufficiently heated with the latter. This, of course, applies to the working by wet collodion in the field; but when dry plates are used in winter, they should also be developed with warm solutions. Mr. Hardwich recommends the employment of the protosulphate of iron developer in cold weather, in preference to the usual pyrogallic solution, adding to it a small quantity of acetate of soda, which has the effect of intensifying the negative. So popular is Mr. Hardwich's formula, that with the majority of photographers, it seems to have almost superseded the old pyrogallic developer. It has been most extensively used as a summer as well as a winter solution, and having employed it successfully myself during the past summer and autumn, I can testify as to its efficiency. But, sir, this is an age of progress, and last week my attention was drawn to an advertisement in one of your contemporaries, headed with the words, "Important Discovery." The announcement proceeded thus: "Every photographer should possess Mr. ———'s winter developers for negatives and positives. Warranted to give results equal to the best productions of the summer season. The recipes, with directions for use, forwarded on the receipt of eighteen stamps. Address, &c. &c."

Now, although I generally distrust advertisements of this sort, I felt a little curious to know what this "Important Discovery" was, the more so as I am preparing to start on a winter's tour with my camera, and have not yet found any of the dry processes to yield results equal to those of wet collodion. I therefore forwarded the eighteen stamps, and in reply received the following:—

"NEGETVE DEVELEP.

Rain or dist water	8 ounces.
Carbonate Soder	2 grains.
Glacel acetic acid	1½ drachm.
Pylogalic acid	9 grains.
Formic acid	2 drops.

The plate to be rediped in the nitret silver bath befor developed. The developen sollutn to be used warm.

POSITIVE DEVELEPR.

Rain or dst watr	4 ounces.
Carbonte of soder	3 grains.
Nitrict acid	3 drops.
Glacel acetic acid	2 drachm.
Formic acid	6 drops.

Mix the above, then add protosulphate of iron, 1½ drachm, nitret of pottass in crystals, ¼ drachm, to be used warm."

For some minutes I was at a loss to perceive in what the "Important Discovery" consisted, the formulæ containing nothing that has not been known for years, being in fact the common solutions, with the addition of carbonate of soda and formic acid, both of very questionable utility.

On reperusal, however, it struck me that the discovery might be in the *nitret* or *soder*, or possibly in the *glacel*, *pylogalic*, and *nitrict* acids. Not feeling quite sure on this point, I determined on sending the formulæ to you, for the benefit (in more senses than one) of your readers.

AN AMATEUR.

NOTTINGHAM PHOTOGRAPHIC SOCIETY.

DEAR SIR,—Perhaps your readers would be interested by a short description of the First Annual Meeting and Exhibition of the Nottingham Photographic Society, which was held in the Exchange Hall, a fine spacious place, 40 feet wide and 85 feet long; and in two adjoining rooms of about 40 feet square, which were devoted mostly to cameras of various makers. Those attracting the most attention were, a lens of short focus, nine inches in diameter (which, I believe, was made in France), also a solar camera, for life-size portraits, which I think is a slight improvement on the original American patented instrument.

The exhibition of apparatus was not large.

The collection of landscapes, architecture, and statuary was very large, including stereoscopic slides (there were more than 2,000 in number, collected from the best photographers and amateurs, in this as well as nearly every quarter of the globe). There were about 30 views sent in for competition, of which three took the prizes offered by the Society. The first prize was awarded to the Rev. J. J. Dredge, for a 10 × 12-inch view of an archway (Southwell Cathedral), taken, in 1856, by calotype process. The second prize was awarded to Mr. Hurley, for a landscape—an old castle, water, and bridge—which was by far the best of its class. The stereoscopic subjects were unusually good, and possess merits of a very high order. The one that took the prize was a landscape, consisting of a labourer's cottage, at Wilford, with thatched roof, having a whitewashed gable as the prominent feature, by Mr. Woodward, chemist, of Nottingham. H. Walter, Esq., Papplewick-hall, and C. Paget, Esq., M.P., were amongst the largest contributors, and deserve much praise for their well-chosen and valuable collection. Amongst other contributions were some fine specimens by Mr. S. Bourne; E. Stegeman, Government Department of Art and Science; Mr. Booker, Derby; Joseph Sidebotham, Manchester, who presented some good specimens to the Society; S. Redgate, oil-colour positives; also a large collection in possession of the Nottingham Photographic Society. I must not forget to notice the few permanent views and copies, printed in carbon, by Mr. Shepperley, druggist, Nottingham, which deserve much praise. Mr. Thompson, optician, exhibited a small and valuable assortment of goods belonging to his profession. The attendance was about 500, of the first families in the town and country, who all appeared highly gratified with the good taste in the arrangement of the various classes and styles of the photographs.

A few short speeches would have been very appropriate; but, as there were none, I can only add that the tea and coffee were ready at nine, and the assembly gradually disappeared about ten o'clock. The rooms remained open until the 15th, at 6d. admission, for the public.—Believe me, yours truly,

A. G. GRANT.

Linby-hall, Jan. 6, 1859.

THE COLLODIO-ALBUMEN PROCESS.

DEAR SIR,—To the questions you have sent me on the collodio-albumen process, I send the following reply:—

1st. Whether all the operations should be performed in a dark room, or the first part of the process carried on in the light? For some time I was accustomed to work in a light room, as far as albumenising the plate, but by some careful experiments of myself and others, it was found that preparation in the light produced a slight mist over the surface of the plate, and if a very strong light were used, this fogging would become very dense; consequently, I now go through all the manipulations in a darkened room. After the albumen has been poured on the plate, it is rendered quite insensible to light.

2nd. How long the plates will keep sensitive? I have kept some plates sensitive five months without any change, but the usual time I should advise them to be kept is, a month in winter and a fortnight in summer: after this they cannot be depended on; some may be good, and others turn yellow during development. The question, *why* some plates will keep undeteriorated so much longer than others, has yet to be solved.

3rd. What is the cause of pin-holes in the skies, &c.? I have not met with this fault for some time; when I did meet with it, I considered it to arise from small undissolved crystals of iodide of potassium in the albumen; I since that time have always used a small quantity of free iodine in the albumen, as given in my former letter, and this, I suppose, has prevented its recurrence.

4th. As to the blistering of the plates; this may be entirely prevented by the following precautions:—Have the plates quite dry before pouring on the collodion; let it set *very well* before immersion in the bath, and dry the plates before the fire after pouring on the albumen. The plates may all be prepared, and allowed to dry partially in the operating room, and then placed on ledges on a large board, and exposed before a hot fire till quite dry and hard.

Trusting the above answers may be sufficient for your correspondents' guidance, I am, sir, yours truly,

January 10*th*, 1859. JOSEPH SIDEBOTHAM.

Photographic Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held at the Literary and Philosophical Societies Rooms, on Wednesday, the 5th of January instant. Mr. Sidebotham presided. A new member was elected.

Mr. OXLEY exhibited a gasometer to contain oxygen for the lantern.

The PRESIDENT called the attention of the meeting to a number of carbon prints by Mr. Pouncey's method, taken by Mr. Mudd, and which were handed round to the members for inspection. The President said, he considered the specimens shown quite equal to any Mr. Pouncey had produced; he thought Mr. Pouncey's specimens very poor, and if Mr. Pouncey could not produce better prints, the process was very unsatisfactory.

Mr. WARDLEY said, he thought the more delicate details of the sun prints could not be obtained by Mr. Pouncey's plan, and he considered it very far short of what was required.

Mr. MABLEY said he had tried Mr. Pouncey's plan for some time past, but had now resolved to relinquish it; several other members concurred.

A long conversation took place as to toning with *sel d'or* and alkaline baths; also as to Mr. Maxwell Lyte's plan of sulphate of soda.

The PRESIDENT called the attention to the subject of developing by daylight after dissolving the iodide of silver, and remarked that it was a curious fact that it was only a collodio-albumen plate which could be developed after fixing, and that several members who had tried, had been unable to develop plain collodion; also that after fixing with cyanide, it seemed impossible to develop.

Mr. YOUNG stated that he had been able to develop after fixing with cyanide, but thought it required much longer time. He exhibited a picture so produced. A long discussion followed as to the theory, and the President said, he had examined the film of an exposed plate after the fixing under a powerful microscope, but could not see any trace of the picture.

The PRESIDENT remarked that Mr. Wild, a member, who was absent that night, had been trying a new process, called

the "treacle posset process," and had obtained some very good results. The plan was to obtain serum of milk by breaking the milk with treacle and acetic acid. The idea had occurred to him from a suspicion that Mr. Norris's plates were prepared with serum of milk. The President remarked that it had occurred to him, the council might get up a stereoscopic magazine from photographs taken by the society for distribution among the members, and the idea seemed to be approved of by the meeting.

A further discussion on the subject of printing took place.

Mr. MABLEY said, he, the other day, looked at some prints taken by him some time since by gelatine and chloride of silver, and developed, and they seemed as good as ever.

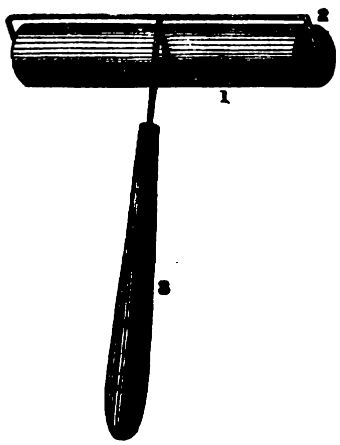
After discussing the method of washing prints, it was considered that a short washing of an hour or two was better than a long one.

A vote of thanks was passed to the President, and the proceedings closed.

Photographic Notes and Queries.

IMPROVEMENTS IN WASHING POSITIVES.

SIR,—The accompanying sketch is that of an instrument that I use to facilitate the washing of prints. I have used it some time, and find it a most convenient thing; a print, I believe, may be effectually freed from the destructive effects of hypo. in about a sixth of the time usually occupied for this purpose, without any fear of the most delicate half-tints being injured, as is frequently the case, by long immersion in water, and no doubt many, to their annoyance have found (as I have), from the same cause the tone of the picture quite altered after five or six hours' soaking in running water. Some have recommended dabbing with a sponge or with cotton wool; a process that invariably works up the pile of the paper, and the unequal pressure of such a mode cannot be depended on.



1. Wooden roller, covered with flannel.
2. Strong iron wire bent to come over the ends of roller, with eyes punched to admit of being screwed into the ends.
3. Wooden handle.

I first screw on, by means of a piece of gutta percha pipe a fish-tail gas burner, the end of the pipe is fixed into the nose of my water tap over the sink; the water, turned on with good force, is the supply for the operation, under which I turn a large square dish upside down and let the water fall upon it, I then place my prints—one or more, according to the size—the back part up, and roll the instrument over them as the water continues to play; during this operation they get a fresh change of water every time the roller passes backwards and forwards, care must be taken that the water flows quite over the print every time; a smart pressure with both hands squeezes the great bulk of the water out every time, and I reckon the print to have had ten or more changes of water every minute during the operation, which could not be effected by any other process. I then place my prints in a square photographic dish, and let the water run through them for about an hour, and consider them to be as effectually washed as if they had been left in running water for six or eight hours, without suffering any damage whatever. When many prints are put together, there has been difficulty in getting the water to flow between them and in keeping them separated; the following is a simple and effectual method:—I have a jeweller's blow-pipe; over the big end I fit a piece of india rubber tubing and stretch this over the nose of the water tap, having it long enough for the bend of the pipe to lie in the bottom of the dish, and then place the dish so that the water rushes up the straight side of it: thus a circular motion is kept up by the under current, and, however many prints may be in the dish, they are continually separated, the angles of the paper are forced against the side, which causes a complete separation, and they each get the same change of water as they flow round.

32, *Sloane Street.* THOMAS WARWICK.

REMOVAL OF SILVER STAINS.

SIR,—I have found the following to be by far the most effectual mode of cleansing the fingers and nails from the stains of nitrate of silver:—First, rub with a moderately strong solution of iodine in alcohol, either with a piece of sponge or a brush; then rinse in water, and afterwards dip in or rub with a weak solution of ammonia.

For linen use the iodine solution, and then dip in weak solution of cyanide of potassium. If, as is sometimes the case, where the stain is partly caused by pyrogallic acid, a yellow stain should remain on the linen, it can be removed by leaving the part to soak for a few hours in a solution of binoxalate of potash (salt of sorrel). H. E. N.

TO PREVENT THE DISCOLORATION OF THE POSITIVE SILVER BATH.

SIR,—As photographers frequently complain that the nitrate of silver bath used in printing albumenised positive pictures becomes highly discoloured, allow me to suggest a simple and certain remedy. In the preparation of a new silver bath for the above purpose, before dissolving the silver add pure alcohol in the proportion of 2 ounces to 10 ounces distilled water, the silver being in proportion to 12 ounces liquid. I have had a bath in use for eighteen months past, nearly as clear as when first made. An old bath sufficiently strong with silver, but red like port wine, may be cleared by using kaolin, and afterwards adding 1 or 2 ounces of alcohol with silver dissolved in it; this will keep the bath clear for a long period. NORMA.

SELF-ACTING LEVELLING STAND.

SIR,—When making a self-acting levelling stand, as suggested by Mr. Sedgfield in your last number, in addition to the bob under the point of suspension, let there be two small weights at the extremities of the frame, and when gently set in motion the balancing power of these weights will cause it to continue for some time, thus keeping the developing solution in agitation, preventing deposits, &c. I have used one of this description for some time, and found it very convenient. R. W.

BEAUFOY'S ACETIC ACID.

SIR,—In the formulæ for Mr. McCraw's process, given at p. 50 of the "PHOTOGRAPHIC NEWS," two of the mixtures are to contain *Beaufoy's* acetic acid, but strength is not mentioned. I learn that there are *five* different strengths of that acid; perhaps Mr. McCraw will be kind enough to indicate the particular sort he used. H. SANDMAN.

NON-REVERSED GLASS POSITIVES, FOR COLOURING.

This effect may be produced by carefully drying the picture, after being fixed and washed, and pouring on to it Archer's transferring varnish (a solution of gutta percha in benzole) in the same way as you would collodion, only allowing the plate to remain horizontal for a few seconds, to allow the varnish to thicken, before pouring it back into the bottle. Dry by applying heat. When the varnish is cold, gently lower the picture into cold water, when the film will separate from the glass; transfer the film to another glass, so as to let the gutta percha side touch the glass, attach with varnish, then colour with ordinary photographic colour, as of course the colour side will now be the right side.

A. G. G.

DEAD BLACK FOR BRASS-WORK.

Can any of our correspondents favour us with a recipe for a dead black for brass-work, similar to that seen on the stage disc of diaphragms, &c., of the best microscopes?—ED.

SYNOPSIS OF PHOTOGRAPHIC PROCESSES.—WAXED PAPER.

Wax the paper.
Iron.
Place in dish of iodising solution 3 to 4 hours.
Dry.
Float in a dish of sensitising solution till of a straw colour.
Wash in two changes of distilled water.
Blot off.
Expose.
Immerse in a dish of developing solution.
Wash.
Immerse in a dish fixing solution.
Wash well.
Dry.
Hold before a fire or iron.

Iodising solution:—

Iodide of potassium	25	grains.
Iodine	¼	"
Water	1	ounce.

Sensitising solution:—

Nitrate of silver	15	grains.
Glacial acetic acid...	6	"
Water	1	ounce.

Developing solution:—

Gallic acid	2	drachms.
Alcohol	1	ounce.
Glacial acetic acid	4	minims.

12 minims of the above to 1 ounce of water, and a little nitrate solution, 45 drachms for 100 square inches.

Fixing solution:—saturated solution of hypo.

H. S. I.

WHAT TO AVOID IN PHOTOGRAPHY.

Do not allow ammonia ever to enter into the nitrate bath.

Do not fix paper positives before washing off the silver.

Do not expose a nitrate bath to the light when in good order.

Do not use cheap nitrate of silver for the nitrate bath.

Do not put away albumenised paper in a damp place.

Do not lift the plate too soon from the bath.

Do not wash positives with hot water until they have been well washed in cold.

Do not attempt to wash the hypo. in a hurry from a glass picture.

ANSWERS TO MINOR QUERIES.

BICHROMATE OF AMMONIA.—*J. M.* This salt may be prepared by taking a strong solution of chromic acid and dividing it into two parts, one of which is to be saturated with ammonia. Mix the two solutions together, and evaporate. As the chromic acid will most likely contain a large quantity of sulphuric acid (from its mode of preparation), the bichromate of ammonia will require to be re-crystallised several times. When pure, it forms beautiful red crystals, somewhat similar to the potassa salt. The formula is $NH_4O. 2 Cr. O_3$.

CORRECTING A FOGGY BATH.—*A Suffolk Man. F. L. S. Hypo.* The following plan has recently been recommended for curing this fault when other methods have failed. Add solution of carbonate of soda, drop by drop, till a slight precipitate is formed which will not dissolve on agitation. Filter it, add a few filings of metallic cadmium, about one grain to each ounce of bath, and boil for about five minutes. Allow it to become cold, and then filter. A little metallic silver will be precipitated, owing to the reducing power of the cadmium, but not sufficient to diminish the strength of the bath to any sensible extent. Before using, a few drops of acetic acid must be added.

TO CORRESPONDENTS.

☞ Some complaints having been made by our subscribers as to the non-receipt of the "PHOTOGRAPHIC NEWS," the publishers beg respectfully to notify that every care is taken on their part to insure punctual and correct dispatch. All complaints should, therefore, be made to the Post Office authorities.

A PHOTOGRAPHER AND A GENTLEMAN.—We fully concur in your opinions and shall, as far as we are able, always act in accordance with them; but we cannot give insertion to your letter.

J. W., CHERBOURG.—Your letter has been received with thanks. We shall be glad to see you.

J. D. J.—The two bodies you name could be prepared on a small scale, but the requisite materials would cost more, and be no more easy to get than the ready prepared salts. A print can be taken from a negative in the pressure frame on a plate prepared by any dry collodion process. Expose for a few seconds to daylight, and develop as usual.

ADOLPHUS.—Would the process you describe possess any advantage over the ordinary negative process of printing?

J. WALTER.—Your suggestion is very good, but you will observe that it was anticipated by a correspondent in our last number.

PLANO-CONVEX.—Send a private address and we will communicate with you.

C. R.—1. Use 1 ounce hypo, 4 ounces water, instead of cyanide of potassium, for the fixing bath; and if that does not remedy the blueish green colour of your positives, change the collodion. 2. By the formulæ given in our back numbers, under the head of Alabastrine Photographs. 3. Use a spirit varnish, applied warm.

A. G. G.—There was chlorine present, which precipitated the nitrate of silver The nitrate or magnesia process has now been superseded by others, in which the surface of the collodion plate is used *dry*, and thus not liable to contract dust.

J. H. B.—We prefer a distance of 3⅜ inches from centre to centre of the lenses in the twin lens stereoscopic camera; as, when bisected and transposed, the pictures will be a convenient distance apart.

H. B. Y.—Neutralise it with a few drops of carbonate of soda; filter, and then make faintly acid with acetic acid.

A POOR LAD.—Expose it to the sun, or boil with cadmium, &c., as recommended in the present number.

H. MITCHELL.—1. The two positions should be parallel. 2. The waxed paper process will give quite sufficient minuteness for ordinary landscape photography. 3. Stop it down to a ¼ inch aperture. 4. Yes; but allow for the thickness of the glass when focussing. 5 and 6 we cannot answer.

P. S.—Received.

H. S. I.—Thanks for the enclosure. We are sorry we cannot help you with your proposed application of the microscope. We have had too limited an experience in such matters to be able to recommend.

T. T. SHEARD.—If your former letter was received, it was answered. We do not, however, remember the subject. If you will repeat the questions they shall be attended to.

A. C. S.—The fault is in the collodion. Is your bath faintly acid? If not, make it so with acetic acid. A reversing mirror would do as you wish.

H. T. T.—Ether 5, alcohol 3, is the proportion we prefer; but it is really of very little consequence what the quantity of alcohol be up to ⅜ths of the whole quantity. The amount of cotton also may vary very considerably without much influence on the result. Experiment for yourself, and use the proportion which best suits your mode of manipulation.

GELATINE PAPER.—Numerous inquiries having been made respecting this article, we think it would be advantageous to all parties if some agent for its supply were to advertise it in our columns.

T. C.—Received.

H C. Y.—You will find nothing so good as linen blinds.

CLAUDE.—Either of the three following sizes of lenses will do for taking landscape stereograms:—¾ in. diameter and 3½ in. focus; 1 in. diameter and 4½ in. focus; or 1¼ in. diameter and 6 in. focus. The smallest lens takes the quickest picture, but has a less field than the others.

Communications declined with thanks:—J. A. X.—Stereogram.—M. Z. Q.—Papa.—T. T. N.—H. O.—Old Hypo.—A Dabbler.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "PHOTOGRAPHIC NEWS:"—Tyro.—J. B. L.—An Old Photographer (see above).—Fix (see our Notes and Queries).—C. A.—S. M. B.—E. P.—Nero.

ERRATUM.—Page 212, line 2, *for* T H. Parnell *read* J. H. Parnell.

IN TYPE:—C. A. (Algeria).—J. D.—R. O. F. S.—A. Practical and Hard-working Amateur.—H. S. I.—G. C.—H. Bonus.—J.B. Robinson.—T. Barrett.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

⁂ All editorial communications should be addressed to Mr. CROOKES, care of Messrs. Cassell, Petter, and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 20.—*January* 21, 1859.

ON THE CAMERA OBSCURA.

BY PROFESSOR PETZVAL, OF VIENNA.*

On the 23rd of July, 1857, Professor Petzval presented his new object-glass to the Academy of Vienna, and at the same time made a communication on the general properties of the camera obscura, which, from its elementary nature, is well adapted to supply photographers with much accurate and valuable information. A somewhat complete abstract of this communication, therefore, cannot fail to interest a large number of readers.

A camera obscura may be defined as an instrument for obtaining, at a finite distance, an image of any number of objects; and, in accordance with this definition, numerous properties at once suggest themselves as desirable.

We may reasonably demand that the image shall be well defined or sharp; that it shall also be well illuminated, so as to exhibit proper light and shade; further, that it shall be true to nature, and also that it shall lie in a plane. If possible, too, the camera should simultaneously furnish images of both near and distant objects,—should possess a large field of view, and give at pleasure either large or small pictures. Lastly, the instrument must have a convenient form, and cost as little as possible.

Most of these desiderata exist in an arrangement wherein the optician's art is unnecessary. If a screen be placed behind a small hole in the shutter of a carefully darkened room, an inverted image of external objects is at once obtained, which possesses, in great perfection, many of the desired properties. We have here absolute faithfulness in nature, pictures at once of near and of distant objects, a field of vision as near to 180° as we please, and either a plane or a curved image. The expense of such an apparatus is small enough, and its convenience indisputable; in short, the picture obtained fails only in sharpness and illumination, but it must be admitted that these defects are so serious as to render the arrangement next to worthless for most purposes. Nevertheless, for many reasons, the arrangement in question deserves closer examination; it furnishes an excellent example of what nature presents, and of what art must supply; we learn from it also how often natural endowments are sacrificed, when by artificial means, we seek to enhance the nobler properties of sharpness and illumination; and lastly, we may here study the nature and influence of the imperfections inseparable from this, the *natural camera*.

Let us assume that the external object is so distant, that every point of the same sends to the hole in the shutter a cone of rays so acute as not to differ essentially from a cylinder. If light were propagated in straight lines, it is manifest that the rays of every such cylinder would reach the screen in full possession of their own peculiar colour and intensity of light, and they would impart both these qualities to a small portion of that screen, nearly circular in form, and of the same size as the hole. The several coloured spots thus formed would group themselves so as to constitute an inverted picture of the object, and the sharpness of this picture would be capable of being augmented indefinitely by diminishing the size of the hole.

Light, however, instead of being propagated in straight lines, is turned aside or diffracted on passing through an aperture, and thus gives rise to far different phenomena. The external object being a luminous point—a star, for instance—its image is not only always greater than the hole; but on diminishing the size of the latter, we find that, as soon as a certain limit has been reached, the image, instead of diminishing accordingly, actually becomes larger and less luminous. On closer examination, this image is found to consist of a round luminous spot, surrounded by concentric rings, alternately light and dark. The central spot is always found to possess the greatest intensity of light, the surrounding light rings being in general so faint as only to be perceptible by artificial means.

We may suppose the defect in sharpness to be measured by the diameter of the above circular spot, conceived to extend up to the commencement of the first dark ring. We learn by calculation that, on the whole, it would be useless to diminish the diameter of the aperture beyond $\frac{1}{60}$th of an inch, and that, under the most advantageous circumstances, the image of a luminous point is a circular spot $\frac{1}{24}$th of an inch in diameter. The picture we should obtain under these circumstances would clearly bear no magnifying whatever, but, on the contrary, would require to be inspected at a distance of 12 feet, at least. To obtain a more correct estimate, however, of the sharpness and illumination of the picture in the natural camera, let us compare it with that of a camera with a tolerably good object-glass of 3 inches aperture, and 11 inches focal length. In the middle of the field, the picture furnished by such a camera will bear magnifying at least ten times; and, consequently, in point of sharpness, is 180 times superior to the picture in the natural camera. With respect to illumination, it will be observed that the two cameras have the same focal length, 11 inches, and consequently furnish equal-sized images of all external objects; their apertures, however, have the ratio 1 : 180; that of the first being $\frac{1}{60}$th of an inch, whilst that of the second is 3 inches.

Now, the focal length being constant, the illumination of a picture increases in proportion to the square of the aperture, so that, with respect to this property, the camera with is 32,400 times superior to that without glass. It is necessary to observe, however, that a picture so well illuminated as the one here used as a term of comparison, could in practice be scarcely obtained.

Two things are worthy of notice in the foregoing. In the first place we see how, by artificial means, that is to say, by means of well arranged and properly curved lenses, it is possible to increase the qualities of sharpness and illumination in an instrument,—the first in the ratio of 1 : 180, and the second, indeed, in the ratio of 1 : 32,400. In the second place, we have become acquainted with a kind of aberration which puts a limit to the extreme use of diaphragms before camera lenses. To illustrate this still more, let us suppose that, in order to improve the properties of the picture, we were to try the experiment of reducing, by an interposed diaphragm, the aperture of the lens from 3 inches to $\frac{1}{2}$ an inch. It is evident from calculation that we should thereby cause the image of a luminous point to become a round spot nearly $\frac{1}{1200}$th of an inch in diameter. Now, in fine engravings, &c. we often meet with lines whose breadth is even less than $\frac{1}{300}$th of an inch; so that if our blinded lens were employed to copy such engravings, these fine lines would appear still finer in the picture, in consequence of the overlapping of the aberration circles of the adjacent luminous points. This defect would also be increased by the aberrations due to other causes, such as the

* Condensed from the *Philosophical Magazine*. For the full report, see *Sitzungsberichte der Mathem. Naturw. Classe der Kaiserlichen Academie der Wissenschaften*, Vol. xxvi., p. 33.

curvature of the image, &c., so that ultimately the fine black lines of the original would in the copy be either undistinguishable, or at most mere pale shadows; at all events, the picture, if it bore examination with the naked eye, would not admit of magnifying.

In order to advance step by step, let us now return to the natural camera, and seek to improve it by introducing into the hole in the shutter a small, simple, and, therefore, unachromatic lens of crown glass, which, for the sake of comparison, we will suppose to have a focal length of 11 inches. Let us examine what good properties are lost and gained by this certainly cheap alteration.

As long as the aperture of the lens is small in comparison with its focal length, we may safely assume that, apart from diffraction, the equally refrangible rays in any incident cylinder are made to converge to a point,—in other words, that, on placing the screen properly, the image of a point in homogenous light is itself a point. This condition of placing the screen exactly in the focus of the lens at once constitutes an inconvenience, inseparable from the new camera, which did not exist in the natural one.

There are, however, graver complications to notice. Glass does not refract all rays of the spectrum alike; each differently coloured ray has a different focus, and the screen cannot, of course, accommodate all.

By similar calculations to that used above, it will be found that the aperture which here corresponds to the sharpest image is about ¼th of an inch, or a little more than seven times the best aperture in the natural camera. Consequently the illumination of image is increased in the ratio of 1 : 50 nearly, though it still remains inferior to the ordinary camera in the ratio of 1 : 648. At the same time, however, the sharpness of the image has been considerably improved. In the natural camera, the image of a point had a mean diameter of 0·04 of an inch; it is now diminished to 0·005. The sharpness of the image is now eight times greater than before, and in this respect is only inferior to the ordinary camera in the ratio of 1 : 22½.

These not very important improvements in sharpness and illumination have been dearly enough purchased; for, although the general faithfulness to nature has not been essentially impaired, the difficulty of obtaining sharp images has been increased, on account of the chemical and optical foci being now separated by about a quarter of an inch. It is true that the difficulty here alluded to might easily be overcome if the linear chromatic aberration, and with it the distance between the foci, were always the same; for then it would suffice to place the plate destined to receive the picture a quarter of an inch in advance of the ground-glass plate. But this distance varies with the distance of the object from the lens, and this varying space between the chemical foci constituting, as it does, so serious a defect, inseparable from all cameras with unachromatic lenses, the best possible achromatism is even more indispensable for this instrument than it is for the telescope itself.

The above formula also informs us of another disadvantage of the new camera as compared with the natural one. In the latter, the fact of the objects being at different distances was of no importance; in the former, however, the images of near objects are more distant from the lens than are those of more remote objects; and since the plane of the screen cannot accommodate all, it follows that if some images are sharp, others cannot be so. This inconvenience compels the photographer to have recourse to many expedients (such as grouping of the objects, &c.), of which some will be considered in the sequel.

Again, the sharpest parts of the picture of a distant plane object no longer fall in a plane, but on a spherical surface whose radius is 16½ inches, and whose concavity is turned towards the lens. In consequence of this unavoidable circumstance, and the many difficulties attendant upon photographing on curved surfaces, sharpness must be sacrificed the more the field of view is increased.

Above all other things, however, the restoration of achromatism is the most important; for the chromatic aberration disappearing thereby, aperture and consequently illumination may be increased, whilst at the same time the aberration arising from diffraction will be proportionally diminished. As is well known, this achromatism is obtained by a combination of crown and flint-glass lenses; and the method which has long been employed in telescopes not only leads to achromatism, but also diminishes a new defect known as spherical aberration.

In Daguerre's time these telescopic object-glasses, transferred to the camera, were in general use. In all probability, too, they were at first placed in the same manner, with the convex side towards the object; but experiment must soon have shown that this disposition was not applicable. For, destined by their construction to give very sharp but very small images, spherical aberration is destroyed only near the axis of such lenses; in consequence of which, when the field of view is larger, a great deterioration of sharpness is observed on passing from the centre towards the edges of the picture. This deterioration is increased, too, by the fact, that the image, instead of being plane as required by the camera, lies on a curved surface, which approaches in form to that of a paraboloid of rotation, whose radius of curvature at the vertex is equal to $\frac{3}{2}$ of the focal length.

In the absence of calculations founded on theory, by means of which the sharpness at the edges of the image might be increased, opticians have sought to improve the telescopic lens so as to adapt it to the camera, by diminishing its superfluous sharpness at the centre, or, rather, by rendering the contrast between the centre and the edges less striking. To obtain a notion of how this may be accomplished, let the object-lens of a good telescope be unscrewed, and turned so as to present its plane side to the object. By so doing, the good telescope will be converted into a very poor instrument; and in order to obtain even a tolerable image, extreme blinding of the lens must be resorted to.

(To be continued.)

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.*

In the present collection, the show of landscape photographs is not large, but it is diversified; and, as was to be expected. Bedford, Fenton, and Morgan are among the foremost. Fenton we have always regarded as the leading English landscape and architectural photographer; now, however, Bedford seems likely to take the lead. In the productions of the former we see scarcely any progress, on the contrary, rather retrogression, while in the latter gentleman's pictures, as we recently remarked, there is great and decided improvement. In Fenton's series there are some perhaps finer than he has ever executed before, but, at the same time, we regret to state that the majority of his landscapes are far below the average merit of his pieces. Among his best are "Tintern Abbey" (46); it is clearer in tone than the generality of his pictures, and as Bedford has happened to execute a view of almost the same place, comparison is forced upon us, and we are compelled to admit the superiority of Bedford's treatment of the subject. "Raglan Castle" (54) is a fine specimen of Fenton's style, but it wants vigour. "The Central Valley, Cheddar Cliffs" (55), is, perhaps, one of his finest. In it there are nice light and shade, and clear foreground. The photograph "On the Wye, the Windcliffe" (62), has combined in it many of the defects perceptible in the whole series. The foreground is so dark that it looks almost as if a curtain were drawn across the picture, while the background is beautifully distinct and clear; the transition from the foreground to the background is so abrupt as at once to strike and offend the eye. Many of Bedford's views are similar in character to those already noticed in the collection of the Architectural Association. In

* Continued from p. 218.

looking at them we are almost inclined to think that they are even finer than those which we have previously referred to. We feel that we cannot speak too highly of this artist's work; everything he does, he does well. It is a difficult matter, out of the large number of subjects he has sent for exhibition, to take one picture and say that it is positively the best of the series; the work is done in such an equal manner that it is impossible to select this or that as the finest. The new views which he has executed for her Majesty, we scarcely like so well as the first series. We do not now refer to the photographic manipulation, but to the views themselves; for this, however, Mr. Bedford is not responsible, inasmuch as the selection is not his, but that of her Majesty. Next in order comes Morgan, who is the nearest competitor that Bedford has. Yet how distinctive are the characteristics of the treatment in each case! Both are successful in the selection of artistic sites, in the beautiful delicacy of intricate detail. Still, each has an individuality so striking, that the most careless observer would at once detect the difference. Morgan's views are numerous. In many points they are much like some that he has previously exhibited, but, generally speaking, they are more carefully executed. In his river scenery he is most successful, and every one of his pictures must be interesting to the artist. "On the Froom, Evening," is a beautiful study. The shadows of the trees, and the reflection of the foliage in the river, are really charming.

There are several views here by T. Davies, chiefly woodland scenery. They have many good points about them, but the artist's style of treatment, and really excellent mode of printing, are hardly adapted to his selections; if he attempted architectural views he would be attended with great success. Rosling's small views are, generally speaking, good, though they would lose nothing by having, in some instances, a little more half-tone. The artistic taste displayed in the "Farm Yard" (5) is far below that which is shown in the "Four Views in France" (91). The "Trees" and "Sweet Chestnuts" are admirably given. As a specimen of architectural photography, "Pitt Press," Cambridge, is interesting. The views by Truefitt Brothers are very feeble in tone. To the Indian Views by W. Hamilton Crape, we are not inclined to award such a high meed of praise as has been bestowed upon them in some quarters. As views of celebrated places in India they have a great historic interest, but in executive skill they are far below others which we have seen. Crittenden's views have many good points about them, but, generally speaking, they are too intense in tone. We may just mention one, "The Baptistry, Canterbury Cathedral" (97), which at once calls to mind Bedford's beautiful photograph of the same. The French views by the late Robert Howlett have the distinguishing beauties which marked his works. The present series of views of buildings are more like copies of elaborate ivory carvings than anything else. Dixon Piper has some good landscapes, although they are not superior to what we have seen by him on other occasions. B. B. Turner we are glad to see continues to adhere to his "Talbotype," and gives us some very clever and interesting views, which make us regret that he is almost the only adherent of this beautiful process. Mr. Melhuish does not appear to have done much for the present exhibition; his landscapes, in many instances, are not equal to what we have seen by him before. To the geologist, Gutch's photographs must prove of the greatest interest.

The show of architectural views is not so large as might have been expected; no doubt the knowledge of the fact that an exhibition formed exclusively of architectural views was about to be formed, would influence photographers, and cause them to abstain from exhibiting here this class of views. The finest view in this way is one of Rome. It is on a very large scale, and is a grand and striking feature in the room in which it is placed. It is immediately over a panoramic view of Cairo, by Frith, and the contiguity of the two is by no means favourable to the patched, uneven tone of the Cairo view. Frith's views are of the same character as those we have noticed before. Fenton's interiors are fine, with a great amount of soft, clear tone. There are several views by Cade, much the same as those in the other exhibition already noticed. In sculpture copying, Fenton still stands unrivalled in the ancient department, while, in copying modern works, Jeffrey seems to be the best; witness the copies from Woolner's bust of Tennyson (167). Picture copying, apart from the Raffaelle Cartoons, is not strongly represented here. Bingham's copies, from Paul Delaroche's drawings, are among the leading attractions. There are two beautiful copies by Howlett. The four copies of engravings contained in frame 198, by William Best, are about the nicest and most successful we have ever seen; the black tone in them is much better adapted to copies of engraving, than the brown one which is seen in Fenton's copies. We must not omit to notice the beautiful little views by Maxwell Lyte. The combination of atmospheric effect, the beauty of his clouds, and the detail of the landscape, cause us to suspect that they are compositions, rather than actual views from nature. Ross and Thompson still continue to prepare botanic studies for artistic foregrounds, though on a larger scale than heretofore.

What could have induced the Rev. J. M. Raven to exhibit his two views, "Pierrefitte" (86), and "View near Luz" (87), we cannot conceive: there is not the slightest pretence to anything like detail in them; they are, in fact, pure and simple blacks and whites. R. Ramsden has some interesting little landscapes, remarkable for clear printing, as "The Vale of St. John, Cumberland" (184), which is rather vigorous in tone. Dr. Holden, we regret to find, only exhibits a few very small views of Durham.

Many well-known photographers are unrepresented, such as Lake Price, W. M. Grimsby, J. D. Llewellyn, and others. We are sorry for this. In looking at the beautiful little picture of "The River at Penllergau" (288), we thought we had fallen upon one of Mr. Llewellyn's choice views, but a reference to the catalogue informed us that it was the work of James Knight. Sedgefield's stereoscopic views, of which we have spoken at length, are here side by side with "The Stereographic Views in Brittany," by Henry Taylor and Lovell Reeve; the latter have, indeed, among them the best we have seen for some time.

(*To be continued.*)

OF THE CHEMICAL INFLUENCE OF LIGHT ON CERTAIN BODIES.*

BY M. E. CHEVREUL.

It remains to be proved if the oxygen receives from the light an analogous modification to that attributed to it in the condition of *ozonised oxygen;* or if the light acts simultaneously on the oxygen and the substances in contact with it. The first supposition would be demonstrated, if oxygen, submitted to the action of the light, and placed afterwards in obscurity in contact with coloured substances, decolored them. In the contrary case, the effect would be due to the simultaneous action of the light, oxygen, and sometimes humidity, without its being necessary to have recourse to *ozonised* oxygen; this is the opinion that M. Cloëz supports.

The facts contained in M. Nièpce's last paper are important, not merely from their connection with the questions attaching to the knowledge of the chemical phenomena produced by the sole or assisting action of light, but likewise, and this is their especial novelty, in that they concern its immediate action, its *dynamic power.*

The demonstration of the fact, that an insolated body, such as a cylinder of white pasteboard, acts in darkness on bodies at a distance from it in the same manner as light emanating directly from the sun, is of primary importance; and M. Niépce has proved that the insolated pasteboard, preserved in darkness in a tinned-iron cylinder, retained its activity at the end of six months.

This discovery leads to the question if—in the remarkable

* Continued from page 219.

experiment in which M. Niépce placed on the edge of a broken porcelain plate a solution of nitrate of silver or chloride of sodium, which he afterwards insolated, and which, after insolation, he carried into the dark room, and washed with a solution of chloride of sodium or nitrate of silver, which gave rise to a violet chloride of silver—it is the insolated porcelain, dry or humid, which is the primary cause of the phenomenon, if the insolation bears on the nitrate or the chloride, or on both of these two bodies exposed to the sun. In the event of the first supposition being the case, the insolation of the dry or humid plate, without nitrate or without chloride, would suffice for the colouring of the chloride produced in the vacuum.

The observation of the nitrates of uranium and copper, the solutions of which leave an almost colourless trace on paper while it remains in the dark, but which become of a brown colour in the light, and which part with this colour on being restored to obscurity, and that a great many times, is certainly a remarkable phenomenon.

To M. Niépce is owing the discovery of a great number of bodies which are susceptible of acquiring by insolation the activity proper to the light.

It remains to be seen if a distinction may not be made between:—

1. An activity proper to a fixed inorganic body which experienced no chemical action during the time that it preserved its activity in obscurity: such would be porcelain absolutely deprived of organic matter, which should become active, dry or humid, under the sole influence of the sun, and which would manifest its activity at a distance and on contact in obscurity.

2. An activity being the result of a slow chemical action, that would be determined by light in insolated bodies, whether that, these bodies being compound, the action was exercised on their actual elements, or whether these bodies underwent this action with the concurrence of the medium in which they might be plunged.

Finally, the observations by which M. Niépce has shown that an action which is commenced under the influence of light is continued in obscurity are very interesting, by the connection which they have with two observations made previously on living plants.

The date of the first of these observations goes back as far as 1810; I made it with M. Hirbel, when we repeated Hale's experiments on the ascension of the sap in a branch of the vine. I summed it up in these words in the *Journal des Savants* of 1822:

"Once that external causes have determined the movement of the juices in the trees, these juices, notwithstanding a decrease in the temperature of the atmosphere, continue to move during a certain time, after which, if external circumstances continue unfavourable to vegetation, their movement diminishes until an epoch when, external causes again becoming favourable, they are acted upon anew."

The second belongs to MM. Cloëz and Gratiolet; they observed that aquatic plants which did not begin to give off oxygen till the temperature was at 59°, plunged in aerated water containing carbonic acid, and exposed to the light, continued to give it off at a temperature which had gradually sunk to 50°.

Last year, on my proposition, the Academy willingly agreed to refer the labours of M. Niépce de St. Victor to the future commission, which will be appointed to decree the prize founded by the late M. Bordin. I have now the honour to propose, that the new researches of M. Niépce may be referred to the same commission.

The proposition was adopted.

PHOTOGRAPHY IN ALGERIA.—No. IV.

My dear Sir,—I suppose you have almost forgotten my existence, it is so long since I wrote to you; but the fact is that, unless I were to go into general subjects, which would be out of place in the columns of the "Photographic News," I have very little to write to you about.

Before leaving Algiers I made a purchase of the wagon I had borrowed on an occasion which I have already described, thinking it would be useful to me for a similar purpose, as well as to convey my baggage and apparatus to Hamed's douar. I was delighted when the morning came for us to start. Ever since I read, when a boy, the delightful journeyings of Mrs. Jarley, in "Humphrey's Clock," I have had a longing for vagabondising in a similar manner, and hence I was delighted when the opportunity came of gratifying that desire; besides, it really is a capital mode of locomotion for a photographer in a country where roads are scarce, and railways have no present existence: moreover, it is almost indispensable in a country where one might travel forty-eight hours without meeting with an opportunity of renewing the supply of water—a matter of some importance to a photographer who likes no process so well as the wet collodion. I do not mean to say that good results may not be obtained by the dry collodion process, for I have been trying both Norris' process and Fothergill's. Of these two, I rather prefer the latter, but both have given me some annoyance at different times; so that, as long as I can make it possible to employ wet collodion, I shall do so. Before starting, therefore, it was essential I should have with me the means of carrying a good supply of water in case of necessity, and, at the same time, I had not space for any bulky vessels. The means I adopted were as follows:—I got several yards of canvas, which I stretched by fastening a rope to each corner and passing them through staples in the wall in a corner of the courtyard of the hotel. I then boiled some linseed oil, into which I had put a certain quantity of resin, and afterwards laid a coating of it on the canvas with a brush, which I then left to dry in the sun. I repeated this process three times, after which it was completely waterproof, as I ascertained by loosening the ropes at one end and letting the canvas hang down, so as to hold seven or eight gallons of water, which I poured on it. The next thing was to convert this canvas into bags, in such a manner as to make them suitable for my purpose. First of all it was advisable, though not absolutely essential, that I should be able to regulate the flow of water from the bag; and it occurred to me that this would be best accomplished by inserting a rough tap, made of wood, in its mouth. After inquiring at a good many shops, I found something of the kind I wanted, and which I think is called in England "a spigot and faucet." I next cut the largest circle possible out of the canvas, gathered the edges up round the tap, and tied it round very firmly with waxed string, and the bag was complete; I could pour the water into the bag through the tap. In this way I made four of these bags, all of which, by a simple arrangement of pieces of rope in the way in which countrypeople are in the habit of supplying the loss of a handle to their pitchers, could be slung from different parts of the wagon, and thus occupied no space in the interior; they had, too, the additional advantage of being available for slinging over a horse's back when occasion required. I have dwelt at some length on this subject, because I think a contrivance of this kind might be useful to a good many of your readers who may practise out-door photography.

Our party consisted of myself, Hamed, an Arab driver, and two others, with a couple of saddle-horses. My wagon was well filled, considering that I intended to use it as a dark room when opportunity offered—for Hamed had bought a quantity of rice, besides a lot of other things, for his domestic consumption. The first day we made a good distance, and at night halted at the house of a friend of Hamed's, who received us hospitably enough; but I should have made but a very poor meal if I had not taken the precaution to put a few loaves I had bought at a French baker's, before leaving Algiers, into the wagon, together with some tea and coffee. It was not that there was deficiency in the quantity of food, but it was the manner in which it was devoured that disgusted me. Just fancy some fifteen or sixteen of us seated in a circle on the ground; in the midst of us there is an enormous tub of rice, which I believe to

have been boiled with the sheep whose carcase is in the midst of it, and the whole then turned out of the cauldron together. Out of compliment, I suppose, to my character of guest and foreigner, I had been furnished with a wooden spoon, but none of the others present possessed such a superfluous implement, nor did they appear to desire anything of the kind, but got along wonderfully by plunging each his hand into the tub and withdrawing it filled with rice, varying the operation at intervals by tearing off a piece of meat. I am not *over* nice in such matters, usually contenting myself with "doing at Bolong as Bolong does," but I certainly did feel rather sick at the thought of going into the tub myself. My host saw that I did not seem sufficiently sharp in securing my portion; so he took my spoon, and, stirring up a portion of the rice with a due proportion of the liquid, precisely in the manner in which I have seen little boys manufacture dirt pies at home, he ladled it into a wooden bowl, and handed it to me, with a piece of meat which he had torn off with his fingers. I looked at the mess, and didn't at all like the idea of eating it; but the reflection that he would be offended if I did *not* eat it, gave me courage to attempt it—and then I was so very hungry—that I made a determined effort, and succeeded in swallowing what he had given me, but he could not prevail upon me to take any more. It was not bad, this Kouskousoo; and now that I have got a little used to it, I like it very much—though the difficulty of making oneself like it is not overcome after the first step, as it was in the case of St. Denis, who walked a league with his head under his arm.

After every man had satisfied himself, the remains were carried into the women's apartments. I hope there were not many of them, for if there were, they must have made a very scanty meal; and as for the dogs—of which there were about a dozen apparently half-starved savage animals—they must have come badly off. All the time we were eating, they had been yelling, barking, and fighting, as they prowled with hungry looks round the circle; and more than once an Arab had been ordered by his master to quiet them; but the method he employed to accomplish this only made them howl the louder, for he struck them savagely with a piece of wood, which it would be using too mild a term to call a bludgeon.

As soon as the remains of the dinner had been cleared away—and this business was very soon performed—I made an excuse to go and look after the wagon, which had been drawn up near the door, and finished my supper on one of the loaves, very much in the manner of the celebrated Mr. Jack Horner. When I had had enough of this, I took a paper of coffee from my store, and begged that it might be made into a liquid for the benefit of the company, and at the same time I handed my tobacco-pouch to a few of the guests who appeared of more importance than the rest, and serious smoking was at once commenced. I am not going to sing the praises of tobacco, which would perhaps be a little out of place in a photographic publication, inasmuch as it is not used in any photographic manipulations with which I am acquainted (though it may be said to possess, to a certain extent, photographic qualities; for instance, it is powerfully acted upon by the solar rays when they are concentrated with a lens, and under their influence changes its colour and condition); yet, I am sure, that the most rabid opponent to the use of the noxious weed—even the distinguished author of the "Counterblast" himself—would take to smoking if he lived among the Arabs. The night was so warm and pleasant, that we seated ourselves on the ground out of doors; and, except when I exchanged a few words with Hamed from time to time, the most profound silence reigned for nearly two hours. I began to think of retiring to my wagon for the night, when suddenly, without any warning, an old Arab began a narrative about a young woman who was very beautiful, and very proud of her beauty. One day she went into the wood near her father's hut to pick up sticks, and was just about to return home with a bundle when she saw a lion, who was regarding her very attentively. Women are women all the world over, and her first act therefore was to scream. The noble animal seemed grieved by the want of confidence in the purity of his intentions which this act indicated. He looked at her appealingly; and there was such an expression of admiration in his leonine face, that she could not help seeing it in spite of her fears. She took up her sticks (a more vulgar historian would perhaps have said that she "cut her stick") and walked, though with a good deal of fear and trembling, to her father's hut, the lion accompanying her all the way, and behaving like a gentleman. Some days elapsed before she had the courage to go again; when she did, she found her new friend had not forgotten her: but this time she was not much frightened; she saw that he was in love with her, and, with the natural instinct of a woman in such a case, she sought to convert him into an ass. It would be too tedious to follow the Arab in all the circumlocutions of his tale, showing how she accomplished this praiseworthy object, but I shall go at once to the *dénouement*. One day, with a vain desire to test the strength of his affection, she pretended to take offence, and chopped his head open with a hatchet. The poor beast bore this suffering and indignity with the meekness which characterises lovers of the "Moddle" kind, and staggered away with a resignation which would have melted any heart but that of a woman too vain to think of anything except her beauty. She had not seen the lion for some days, and began to think that the chop had been too much for him to digest, when, as she was walking thoughtfully along, she saw him approaching. This time his countenance was changed; and, instead of the mute lover, it was the angry avenger who thus addressed her:—"Ayeshu, I have loved you long. I have borne with patience the contumely you have heaped upon me. When you struck me, I did not resent it—and why was this? Because I loved you, Ayeshu. But what was that which I heard you say this morning in your father's hut? that I was an ugly brute, an unclean feeder, dirty . . . . . . I forgave the pain you inflicted on my body, but I cannot forgive the pain you have inflicted on my pride." So saying, he took her in his mouth, and disappeared with her in the wood, and she was never more seen of mortal man.

MORAL.—It is easier to pardon personal injuries of any description than to forgive an offence against our self-love.

C. A.

ON AMMONIACAL COLLODION.

BY P. C. DUCHOCHOIS.

THE new preparation of collodion (which was published in vol. i. p. 146 of the "PHOTOGRAPHIC NEWS") can be so well appropriated to dry processes, that I tried to render it as perfect as possible—indeed, employed with uniodised preservative, or with iodised gelatine and albumen, as well as without any kind of preservative, that collodion has often given as good results in the numerous experiments I have made. There has never been any raising or any blistering. However, it will be found that is not durable, for it does not keep in good condition more than a week or two—the ammonia decomposing the pyroxyline so powerfully, that the film becomes without consistency, and very opaque. It is therefore necessary to neutralise the action of the alkali in order that the collodion may keep as long as any other. Acetic, hydriodic, and hydrobromic acids answer that purpose very well, and do not change the properties that render this collodion so good for dry processes; but what is equally important is, that whether the iodide or bromide of cadmium (or any metallic base, iron excepted) are employed in its preparation, it does not thicken as collodion prepared with those iodides according to the ordinary formula, thus removing the only objection to the use of metallic iodides and bromides in negative or positive collodions for *wet* or *dry* operations. It even seems that the very porous and divided state of the film is more propitious to the sensitiveness of the preparations, and determines a greater intensity of the

negative. It is also worthy of remark, that, the ammonia rendering the collodion very fluid, almost every soluble pyroxyline can be employed to prepare it.

The improvements made in the collodion are the following:—To prepare the plain collodion by adding a few minims of liquor ammoniæ, which is left to set four or five hours; then—1. To neutralise with acetic acid if the collodion is not to be iodised, but merely serve as a support to gelatine or albumen, as in the processes of MM. Gaumé, Bayard, and Crookes. 2. If the collodion is to be iodised, to neutralise with hydriodic or hydrobromic acid, and to add some carbonate, and filter, after having shaken for one or two minutes. The modified formula for dry collodion, which may be used with or without uniodised preservative, is—

Ether, sp. gr. 0·72	... ...	6	fluid drachms.
Alcohol, sp. gr. 0·809	... ...	2	"
Pyroxyline (either)	... ...	6	grains.
Liquor ammoniæ	... ...	2	minims.
Bromhydric acid	... ...	4	to 6 minims.
Iodide of zinc ...	... ...	4	grains.
Bromide of cadmium ...	...	½	"

The silver bath and developer as in my former communication.

"VOL À LA PHOTOGRAPHIE."

THE competition among individuals calling themselves photographers, in Paris, is so great that portraits are taken at 20 sous and even at 15 sous each. Under these circumstances the number of portraits taken is so great that it is not an unusual thing for these so-called photographers to call at people's houses and offer their services; and recently some of those gentlemen, who get their living by preying upon others, have adopted this contrivance for getting admission into houses from which they generally contrived to carry away something they did not bring with them. The *modus operandi* is thus described by a witness against two of these persons, Rousin and Chambard. "I was sitting in my room when the prisoners came in and offered to take my portrait cheap, and one of them pulled out some specimens and showed me. I told them I was not in the humour, upon which they apologised and left; but they had scarcely left my room when I missed my watch, and ran after them and demanded it. As they refused to give it up, I called out *thieves*, upon which one of them held me by the arm while the other ran back and threw it on the bed; and when the policeman arrived, naturally enough, they denied having the watch."

Fortunately for Chambard he had the protection of a gentleman calling himself a member of a provincial academy, who, after asserting that Chambard was as incapable of committing the offence as he was himself, concluded his letter by saying—"And this is the poor, the honest man, that the precipitate and rash deposition of a woman . . . . has caused to be placed under lock and key, a prey to the rigours of cold, *to the privations of hunger*, and the tortures of a wounded spirit." This appeal on his behalf had the effect of saving him from present condemnation; while his accomplice received a sentence of two years' imprisonment.

Lessons on Colouring Photographs.

COLOURING POSITIVES ON GLASS—(*continued.*)

Alabastrine Photographs.—The same material is used for colouring these as for ordinary glass positives, with some slight modification, however, of the method to be pursued. It is better to varnish the picture before colouring, for more than one reason. In the first place, from the peculiar surface, it is generally easy to secure sufficient intensity of colour by one application. A more important reason still for varnishing first, arises out of the powdery nature of the lights in these pictures, which renders it difficult to colour them without scratching or abrading the surface by almost every movement of the brush. Varnishing with a proper varnish renders this surface tough and hard, without in any degree diminishing the purity of the whites, whilst it gives depth and transparency to the shadows, and renders the surface the finest that can possibly be had for receiving dry colours. The same method of colouring, already described, will then be pursued, with additional care, however, in applying the tints of the necessary depth in the first colouring. From the delicacy of these pictures, it is especially important that pure tints be used, as bad colours or careless manipulation become glaringly apparent; while on the other hand, with care and skill, the very finest and most artistic results may be produced. After colouring the picture throughout, if additional brilliancy or intensity be desired, the picture may be varnished again without in any appreciable degree diminishing the intensity of the tints already applied; the picture may then be recoloured throughout. These pictures should always be backed with dark velvet,—maroon is best,—instead of black varnish.

Finishing the picture.—We have now conducted the reader through all the steps of colouring positives on glass. A few finishing touches will generally be required to complete the picture. After colouring the draperies and background, once more return to the face, the colouring of which will generally appear somewhat modified by the effect of the surrounding tints. Re-touch such portions of the face, hair, or draperies, as may seem to require additional intensity, and soften, with a clean, soft pencil, such points as appear too glaring.

The colouring completed, take a clean pencil with a fine point to remove such portions of colour as may accidentally have touched and adhered to parts not intended to be coloured. Some care is necessary in doing this, as there is danger of rubbing the colour in, and causing a smudgy mark, instead of removing it. The pencil should be applied very lightly, and may sometimes be slightly moist, or, what is better, slightly greasy from touching the skin, so that the colour will readily adhere to it and leave the plate. This completes the work.

Mounting, &c.—A few words regarding the fitting, mounting, &c., of coloured pictures, may not be altogether inopportune here. No *entourage* so completely harmonises with a coloured picture as a gilt mat or spandril; and in respect of glass pictures generally, as they are more suitable for cases than for any other kind of fitting, they are mostly surrounded by the gilt mat. We regard them as most suited for cases for this reason: they are distinguished by delicacy rather than by vigour or breadth, and their beauties are best seen by close inspection. With the exception of the alabastrine photographs, very few glass positives have sufficient vigour to serve any purpose in ornamenting the wall of a room. Where they are intended for such purpose, however, it is important that they should be suitably mounted. Nothing can be worse than the passe-partouts usually sold for the purpose, which are generally either black or white. The whites of an ordinary glass picture will rarely bear proximity with the intense white of the passe-partout without being "killed," as it is technically termed. The contact with black is scarcely better, as it has the effect of impoverishing all the shadows. A light neutral tint would answer the purpose much better, and a gilt mount best of all. We have seen some English passe-partouts, with broad margin, made of the common sand gold-paper, which answer the purpose admirably well. Being made into passe-partouts, and thus protected by the glass and sealed edge, there is no danger of the bronze powder, with which they are coated, discolouring. For those to which we refer an absurdly high price was charged; but there are, surely, enterprising manufacturers to whom it would be worth while to step out of the common track, and produce something of the kind at a reasonable price.

(To be continued.)

Photographic Chemistry.

CHEMICAL MANIPULATIONS—*(continued)*.

Filtration (continued).—Sometimes the liquid to be filtered is thick or viscous, like albumen, solutions of gelatine, and those which contain starch in suspension; all these filter very slowly, so that in certain cases there is a possibility of changes taking place during the operation, as in the case of collodion, for example, by an unequal vaporisation of its constituent parts. In such cases, filtration may be hastened by atmospheric pressure; this may be effected by a very simple contrivance, such as passing the neck of the funnel through a cork fitting into the opening of an air-tight vessel placed to receive the liquid, from which the air is exhausted by a very simple contrivance; but as the student could not construct this apparatus for himself with any advantage, it is not necessary that we should minutely describe how it is accomplished. The piece of cotton or tow should be thrust lightly into the neck of the funnel, and, as the pressure upon it will be considerable, it is a very good plan to place previously a piece of bent silver wire in the neck of the funnel, to prevent the tow from being sucked down too tightly in it. In this way the thickest liquids may be filtered with great rapidity.

The next process we have to consider is, *crystallisation*. Certain substances dissolved in water are recovered by the cooling of the liquid, or by evaporation, when they will be found to have changed their shape, and to have assumed beautiful and regular forms—they are crystals. These crystals take a certain form proper to the substance crystallised; and though the same body may yield crystals of more than one form, yet it will invariably be found to assume one or other of the forms peculiar to itself, and not that of a different body. The regularity in the shape of the crystals will be greater in proportion as the operation was performed slowly, and while the liquid was preserved from all agitation. The principal use of this tendency of certain substances to assume a crystalline form in photographic chemistry is, to insure the purity of the chemicals. When this is the object, it can best be attained by agitating the liquid occasionally during the cooling, so as to fracture the nascent crystals, and obtain them in as minute a form as possible; after which, they must be washed in cold distilled water to free them from the mother-liquor, and spread on blotting paper to dry. To produce crystallisation, it is sometimes necessary to reduce the temperature of the liquor almost or quite to the freezing point, and, in other cases, to boil it until it has evaporated. The most trifling causes occasionally determine the crystallisation: for instance, if we saturate a quantity of hot water with that familiar substance known as Glauber's salt, and then pour the hot solution into a glass globe, the mouth of which we close by tying over it two or three thicknesses of wet bladder, we shall find that so long as the globe is preserved from agitation, the liquid will remain free from crystals; but if we untie the bladder, or drop in a single crystal of the same salt, or touch the surface of the liquid with a metallic point, or even violently agitate it, crystallisation will at once begin, and gradually extend downwards, until the whole becomes a solid mass.

Precipitation.—To precipitate a body is to separate it from its solvent, either by making the one or the other undergo a purely physical change, or, as is most usual, by inducing a chemical change on the constitution of the solvent, or of the body in solution: thus, in the case of nitrate of silver dissolved in water, the metal is precipitated by being converted into an insoluble chloride or iodide of silver.

These precipitates being always impregnated with liquid, it is necessary to purify them by washing. The washing may be accomplished by means of the filter, or by decantation by means of water, or any other suitable liquid.

(To be continued.)

Dictionary of Photography.

AMPHITYPE.—This process is a discovery of Sir J. Herschel's, and receives its name from the fact, that both negatives and positives can be produced by one process. The positive pictures obtained by it have a perfect resemblance to impressions of engravings with common printers' ink. The process is difficult, and has not been much carried out; and, as yet, pictures by this process are only to be met with as curiosities.

ANALYSE.—To resolve a body into its elements; to separate a compound substance into its parts or proportions for the purpose of examining each separately; to separate a compound body into its constituent parts.

ANGULAR APERTURE OF A LENS.—The angle formed by the converging pencil of rays transmitted by the lens; or, the proportion between the focal length of the lens and its working diameter.

ANHYDROUS.—Perfectly dry; destitute of water either mechanically or chemically combined.

ANIMAL CHARCOAL.—A common article of commerce; known also as *ivory black*. It may be prepared by burning ivory or bone shavings in a closed crucible. It is employed in photography to decolorise solutions of silver which have been used with albumen. It is only necessary to pour the nitrate of silver upon a tenth part, by weight, of animal charcoal, boil the whole for a short time in a porcelain capsule, and then filter. We do not, however, recommend it, as *kaolin* is far preferable.

ANTHOTYPE.—A process discovered by Sir John Herschel, and founded upon the sensitiveness of the expressed juice of flowers. Certain precautions are necessary in extracting the colouring matter of flowers. The petals of fresh flowers are to be carefully selected, and crushed to a pulp in a marble or porcelain mortar, either alone or with the addition of a little alcohol, and the juice expressed by squeezing the pulp in a clean linen or cotton cloth. It is then to be spread upon paper with a flat brush, and dried in the air without artificial heat. If alcohol be not added, the application on paper must be performed immediately, as the air (even in a few minutes) irrecoverably changes or destroys their colour. If alcohol be present, this change is much retarded, and, in some cases, is entirely prevented. Most flowers give out their colouring matter to alcohol or water: some, however, refuse to do so, and require the addition of alkalies; others, of acids, &c. Alcohol has, however, been found to enfeeble, and, in many cases, to discharge altogether these colours; but they are, in most cases, restored upon drying when spread over paper. Papers tinged with vegetable colours must always be kept in the dark, and perfectly dry.

APERTURE.—The diameter of the available opening in front of the lens, whether its full opening, or the size of a diaphragm.

APLANATIC.—This name has recently been applied to a form of view lens, in which the aberrations are almost entirely corrected, and the images of distinct objects formed more nearly on a plane, than by any other combination extant.

APPARATUS.—A term applied without any distinction to the implements, instruments, &c., used in photography.

AQUA-REGIA.—A mixture of two parts of hydrochloric acid and one part nitric acid, each pure and concentrated. It derived its name from being the only liquid which would attack gold—the king of metals.

AQUEOUS.—Watery; partaking of the nature of water; prepared with water.

AQUEOUS SOLUTION.—Any substance dissolved in water.

AREOMETER.—Another name for the hydrometer, which is an instrument by means of which the specific gravity of solutions is measured.

ARGENTINE.—Resembling silver; pertaining to or containing silver. Derived from *argentum*, the Latin for silver.

(To be continued.)

A Catechism of Photography.

DEVELOPING THE IMAGE.

Q. How is the collodion picture to be developed after exposure in the camera?

A. It must be removed into the dark room, taken from the slide, and placed on the levelling stand. Great care is necessary in conducting this operation; as even the warmth of the fingers in taking the plate from the slide will sometimes render the picture more energetic in some parts than it is in others.

Q. How is the developing solution prepared?

A. Various formulæ are given; amongst them are the following:—

Distilled water	250 parts.
Pyrogallic acid	1 part.
Citric acid	1 part.

Or—

Distilled water	250 parts.
Acetic acid	20 parts.
Pyrogallic acid	1 part.

Or—

Pyrogallic acid	10 grains.
Distilled water	5 ounces.
Glacial acetic acid	1 drachm.
Spirits of wine	½ drachm.

Mixed, and thoroughly filtered.

Q. How is the developing solution to be applied to the plate?

A. It must be poured over it until the whole surface is uniformly covered in every part.

Q. Is not that part on which the solution is poured likely to be more affected than other parts of the plate?

A. In order to avoid this, it is desirable not to hold the vessel from which the solution is poured too high; also to move the hand in pouring the solution, and gently to blow upon the surface of the plate.

Q. What purpose is answered by blowing on the surface of the plate?

A. It has the double effect of diffusing the solution more evenly, and causes it to combine more freely with the damp surface of the plate.

Q. How is the photographer to ascertain when the picture is sufficiently developed?

A. This is only to be ascertained by observation: but, in order to facilitate these observations, a piece of white paper may be held beneath the plate, the result of which is, that the condition of the picture can be clearly seen.

Q. Is not a little nitrate of silver sometimes added to the developing solution?

A. Yes; from eight to twelve drops of a fifty-grain solution of nitrate of silver may be added to half an ounce of the developing solution.

Q. In the formulæ for the developing solution, mention is made of acetic acid in one instance, and of citric acid in another. Which is considered the best?

A. Opinions vary on this subject. The development of the picture by either process is rapid, but is more rapid with the acetic acid than with the citric acid. It may also be observed, that the blacks given by the citric acid are more transparent than those given by the acetic acid, and this difference is still more observable in the proofs.

Q. In cases where the development is not so successful as could be desired, what remedy would you suggest?

A. In some instances it is found useful to re-dip the plate in the solution of nitrate of silver, as the development is not likely to be successful unless the surface of the plate is well moistened.

Q. Is not the sulphate of protoxide of iron employed in developing collodion?

A. This agent is occasionally employed, and the solution is energetic—instantly developing the picture. This rapidity of action has no particular advantage, as it is difficult to manage it with that care which is so essentially necessary for the production of a good picture. The solution is composed of—

Saturated solution of sulphate of protoxide of iron	100 parts.
Water	500 parts.
Acetic acid	20 parts.
Spirits of wine	20 parts.

Q. Is the development of the picture by the application of this solution instantaneous?

A. No; the picture is gradually developed. If the intensity is not so great as is desired, the solution may be poured off, and a solution of nitrate of silver added.

Q. Must the iron solution be previously prepared?

A. The saturated solution of the sulphate of protoxide of iron should be prepared some time before it is required for use.

Q. Is alcohol, or spirits of wine, essentially necessary to the solution?

A. The spirits of wine is not indispensable, but it serves to spread the liquid more uniformly over the surface of the plate.

Q. When may the picture be considered sufficiently developed?

A. When the blacks are well brought up, and the whites fully and clearly seen. Full effect in the light and shadow is necessary to constitute a good picture.

NOTE.—The cubic centimètre is a French measure of capacity equal to seventeen minims, apothecaries' fluid measure.

(To be continued.)

Correspondence.

ALABASTRINE PROCESS.—RESTORING FADED PAPER POSITIVES.

SIR,—In vol. i. p. 180 of the "PHOTOGRAPHIC NEWS," I see my initials quoted as being connected with a communication to another journal on the alabastrine process, which is the same as I sent to you, and published in vol. i. p. 81. I see it is in your "Almanack." A solution composed of—

Chloride of ammonium	30 grains.
Bichloride of mercury	10 "
Protosulphate of iron	20 "
Nitrate of potash	12 "
Distilled water	1 ounce.

answers very well for redeveloping faded positives on paper if not gone too far. I had a number of stereograms that were quite yellow, which I treated with this solution; now they have a most beautiful purple lake tone. I poured a little of the solution on the picture, and spread it with a glass rod for about two minutes, then washed off under the tap. Lately taking the plates, which, together with mats and preservers, had for some time protected a few positives (the backgrounds of which had been painted with Chinese blue, flake white, and drop black, the blue being predominant), and breathing on the inner side of each, I found an exact copy of the photograph which it covered, the figure being dark and the background light. Can this be accounted for? Light had not been admitted through the picture.

In your "Almanack" you have omitted the very thing that makes old Moore so notorious, viz., Fine and pleasant weather, affording much pleasure for the photographer—Rather unsettled—Photographers had better prepare plates—Thunder may be expected about this time—Photographers will do well to mind their baths, &c.; and the hieroglyphic predicting the downfall of hypo. JOS. B. ROBINSON.

Macclesfield.

THE *Constitutionnel* has a leading article on the damage done to, and the coming downfall of the engravers' art, owing to the rapid strides made in the process of photography as applied to transfer of paintings.

Photographic Societies.

NOTTINGHAM PHOTOGRAPHIC SOCIETY.

Exhibition at the Exchange Hall.

LIGHT—one of the essential conditions of existence of nearly the whole of the vegetable and animal life, is now—by the aid of science—made to play the artist, and picture forth the varied phases of nature. It is true, that only *in part* can photography, at present, do this. It is not discovered how to bring out the colour which is said to be latent in the image, neither is it known how to produce *all* the gradations of light and shade as in nature; for instance, a bright yellow against a violet ground would show in a photograph a reversed effect—the yellow appearing dark, and the violet light. This, so far as is known, is owing to the yellow ray of light having the least influence in changing the condition of the sensitised surface, and the violet ray the greatest; but whatever imperfections there may be in this truly wonderful art, it is satisfactory to know they are almost daily becoming less, and that principally through photographic societies.

The alchymists of the sixteenth century, in searching for the elixir of life, stumbled upon the great fact that salt of silver became blackened by exposure to light. In the eighteenth century this remarkable phenomenon engaged the attention of Petit, Chaptat, Dieze, Scheele, Sennebier, Ritter, and Wollaston. Yet but little progress was made in the science until Wedgewood, Sir Humphrey Davy, Nièpce, Daguerre, Sir John Herschel, Fox Talbot, Hunt, and others astonished the world from time to time with their discoveries. It is but a very short time ago that the scientific world considered it to be a marvel that a portrait could be taken in *only half an hour*. What should *we* say to that at the present day, when for sixpence, and two or three seconds of time, Dick may get a "tografy pictur" of his friend Bill, and honest Jack Tar, a "krect likeness of Nancy;" and the wealthy individual may fill his portfolios, and, by the fireside, mentally travel over the world, and see the temples and pyramids of Egypt, the cities of Palestine, the ruins of Rome, the beautiful architecture of Venice, Alpine snows, and the desolation of ages on Teneriffe, where, 12,000 feet above the sea, amidst pumice and trachyte lava, flourishes the deep-rooted *retama!* The English landscape, with every leaf and blade defined with microscopic beauty, and the impetuous rolling wave ere it falls, are pictured, the latter, with all the delicacy of its spray work. If nature can work such pictures as these—what a world of beauty becomes this "very dull work-day world"—what an occupation for an intelligent mind—what a means of general improvement by permanent exhibitions—what a lesson to those who have the habit of regarding the sky as so much ceiling, and valuing green fields and forest trees at so much per square yard and cubic foot! The very stones preach sermons, and groups of wayside weeds which one is apt to pass by without the slightest notice, become a picture of loveliness, and the wonder is they were never so seen before.

The character of every age is stamped upon it by the works and thoughts of the people, and as regards the present, although in some things there may be a tendency to suck the egg of knowledge by making an *incision* at the *apex* and another at the *base*, instead of *merely making a hole at each end*, it can, nevertheless, claim many improvements upon the days of "Auld lang syne," by three extraordinary discoveries, viz., the Telegraph, the Rail, and Photography. A thought is decked with electricity, and sent to its destination in a few seconds. Timothy Tomkins, Esq., breakfasts with a friend in London, and dines with another in Edinburgh. A bit of glass is stuck in a dark box, and, by the aid of chemistry, the fleeting lights and shades of the sun-lit landscape are instantaneously arrested. We can fancy the incredulous looks of our venerable grandfathers and grandmothers, and the lengthened visage of doubt and unbelief of even the man of science, if the wonders of the day we live in had been predicted to them; and of all the departments of science, perhaps none have made such rapid progress within a few years as photography.

As might be expected, in many productions of the photographic art, there is want of taste and artistic feeling. No greater illustration of the value of art could be given than a mixed collection of photographs; and although the works in the Nottingham exhibition are of average high merit, we have only to compare Rejlander's "Home, sweet home," and his two studies from a child, called "Perception and Contemplation," and one or two of Robinson's works, and Sidebotham's "Bridge at Strines," Fenton's landscapes, and Woodward's stereographs, with some other productions, in order to be convinced of the superiority that an operator must have, if he can combine art with science. There can be no art in any work that does not prove that the mind has an inward perception of the beauties and capabilities of the subjects—a seeing with the mental eye all that appertains to it; and however laudable it may be to produce a "sharp picture," it must not be forgotten that, when that power is acquired, the real labour of the photographer has only just begun. But in every new discovery, for a time, the manipulative treatment is apt to engross the whole attention, while the aim and purpose are too often lost sight of; like the young painter, who fancies that if he could only mix his colours *right*, he would be able to *paint*, and is disappointed to find that when he *can mix his tints*, he is not nearer to art than before. The celebrated photographer, Delamotte, says: "It is in the hands of the true artist, or man of taste, that pleasing results must be looked for. He who proceeds mechanically in his task may, by a fortunate accident, produce a good picture; and we have abundant evidence to show us that the mechanical treatment of nature is most common and least successful. It is in the hands of artists that photography will attain the highest execution, artists to whom the attainment of *effect* is intuitive, while they themselves will acquire much valuable instruction from studying its results. *Notwithstanding the microscopic accuracy of detail presented in a good photograph, its chief value and excellence will be found to consist in its sacrificing certain details, and in its representing masses of light and shadow.*"

As regards the educational value of photography, it will, no doubt, become universal. Already the Science and Art Department have had photographs taken from Raphael's Cartoons, the largest size being four feet. We learn that the Departments will shortly be prepared to offer them to public schools at a moderate cost. This is a step in the right direction, and it is to be hoped will lead to something better still, viz.,—a permanent exhibition of the arts and sciences, in which the photographic art would necessarily bear an important feature. It would be a place for improvement and intellectual recreation. And no place could be more appropriate than the School of Art, *i.e.*, *when it is built*; and provided the subjects were properly classified, the exhibition would form a valuable resort for reference to the architect, the artist, the mechanic, and to all engaged in industrial pursuits. Such an exhibition, especially if good music was introduced at stated times, would be more likely to draw the working classes from pernicious habits than all the platform laments in the world. We have been led to these remarks from actual observation and experience of the last exhibition of the School of Art, and the present one of the Nottingham Photographic Society, which, we are sorry to say, will close on Saturday.

The subjects which comprise the works exhibited, may be divided into three classes—Architecture, Landscape, and the Figure—and in each class there are some very remarkable and perfect specimens. Architecture is well represented by Le Gray, Bisson Frères, and MacPherson; the large ones by Bisson being most perfect specimens, leaving nothing to be desired, and the illustrations of Rome by MacPherson are most instructive. The "Two Ways of Life" by O. G. Rejlander, must rank among the most extraordinary productions that photography has produced. The attitudes of some of the figures are exceedingly appropriate and graceful, though in other parts of the picture there are several artistic defects. The "Scripture Reader," by the same artist, is a more perfect work. "Fading away," by Henry P. Robinson, has some good qualities, and the girl who has been the model has evidently understood her part, the expression on her face being quite in keeping with the subject. The mother, who has closed the book which she has been reading, and is holding her spectacles on her lap, is simply *looking on*, and might be merely a portrait of a respectable middle-aged lady. The position of the hand holding the spectacles is very good, but the other is bad; it would have been better to have hid that, and placed the book open on the stand in front. This figure is an instance of the great difficulty that photography has

to contend with. (What a world of love and anxiety should have been expressed in the face of the mother, who sees her child fading away!) The single reclining figure, with the words appended, "She never told her love," by the same artist, is a very fine work; the position of the head, the expression of the features, and the long hair falling over the light surface of the pillow, are of high merit. The position of the hand is bad; few people are aware that there may be nearly as much expression in a hand as in a face. The drapery is well arranged. "The Monk," by Lake Price, is a very fine picture; the composition is good, and if it were not for a slight indistinctness in the expression of the face, it would be a perfect work. Maull and Polyblank's Gallery of Celebrities are most excellent specimens of portraiture. Among the number which strike us as being the most remarkable are, Professor Owen, George Cruikshank, Dr. Lyon Playfair, J. Gibson, R.A., C. Stanfield, R.A., John Connolly, Lord Stanley, and the Earl of Rosse. The photographs of Liverpool life, whatever they might have been originally, are certainly spoilt by being badly painted. Some photographic portraits of a large size, and painted over with oil colour, by Redgate, are good: there is rather a heavy appearance about the draperies; the two largest portraits are works of great merit as regards the colouring of the flesh.

Among the beautiful landscapes, which adorn the room, "Home, sweet home," is a charming production, thoroughly poetical, and English in character. A river, some foliage, a solitary cottage in the distance, constitute the materials of the composition. Mr. Rejlander might have set his camera only a few yards off the point of view from which this picture was taken, and have spoilt it; the bit of bank in the foreground is just right. Mr. Sidebotham's small picture of a bridge near Strines is another of the gems, which for delicacy of tone and effect it would be difficult to surpass. Thurston Thompson's studies of trees and lane scenery are very excellent, and well adapted for the artist's studio.

Fenton's landscapes, and Le Gray's sea pieces, with clouds, taken instantaneously, are very beautiful, and display a careful selection of the point of view. The two views of Rouen, by the late Robert Howlitt, and taken with the new orthographic lens, are perfect. There are also some excellent views by the Rev. J. J. Dredge. Mr. Bourne's "Nottingham Castle," "Audhem Church," "Newstead Abbey," and "The Wheat Field," we believe to be among the best which he has exhibited. Dr. Good, of Derby, and Miss Hurst, of Alderwasley, exhibit some good landscapes. "The Doorway at Dunstable Church," by Nowall; "Rocks at Cowden Knowes," by Cotesworth, and the works of Archibald Briggs, Alfred Rosling, the Rev. J. Holden, and Mr. Smith, are remarkable for their beauty, especially some which are done by the calotype process. Frith's illustrations of Egypt and Palestine, exhibited by the Nottingham Photographic Society; and a large collection of framed photographs, contributed through the School of Art, by the science and art department, are an evidence of the instructional value of the art; and the photographs of "The Moon," by Father Secchi, Nasmyth, and J. Sidebotham, of its application to science.

An immense lens, said to be the largest in England, was exhibited in the room appropriated to materials, and a solar camera, both from Atkinson, of Liverpool. Cameras, tripod-stands, dark boxes, slides, a dark tent, stereoscopes, and the finest stereographs, were exhibited by Ottewell, Horne, Thornthwaite, Shepperley, Thompson, and Woodward. The stereographs on glass, from Dr. Hill Norris, of Birmingham, are very fine. Mr. Smith showed, on the evening of the conversazione, one of the largest of microscopes. Mr. Thompson, optician, covered nearly every square inch of a table with achromatic microscopes, lenses, cameras, chemicals, microscopic photographs of the Royal Family, and a photograph of a £20 note, being a marvellous piece of workmanship.

The contributions sent by gentlemen residing in the neighbourhood were numerous, and among them, perhaps, none excited so much attention as those sent by Mr. Henry Walter, of Papplewick Hall. The taste shown by this gentleman in the selection of his photographs is encouraging to photographers who aim rather at producing good and artistic pictures than at producing the largest possible number.

Among the other contributions we have observed the names of Henry Walter, Esq., Charles Paget, Esq., M.P., the Right Hon. Lord Belper, the Rev. R. Miles, the Rev. C. P. Clifford, &c.

The Nottingham Photographic Society has been presented with four beautiful landscapes, by Mr. Alfred Rosling, of Reigate; three landscapes, by Mr. Sidebotham, of Manchester; and the picture in the exhibition, "Fading away," by Mr. Henry P. Robinson, of Leamington.

The prize pictures are:—Class A, "West Door, Southwell Minster," by the Rev. J. J. Dredge. Class B, "Newark Castle," by J. F. Hurley. Class C, a Stereograph, "Cottages at Wilford." The three pictures are presented to subscribers.

It is exceedingly gratifying to know that many gentlemen of this town and neighbourhood are taking a practical interest in photography, and often a leisure hour is employed by them in this fascinating art, in spite of finger-stains, the smell of acetic acid, &c. &c. The productions of Mr. Henry Taylor, Mr. Felkin, Mr. Webster, Mr. Steegmann, Mr. E. J. Lowe, and Mr. J. Hine, fully prove that such occasional employment of time must lead the mind to appreciate the beautiful in nature, and assist in the diffusion of correct taste in art.

F. R. F.

North London Photographic Association.

At the last meeting of this association, some interesting photographs were exhibited by Mr. Shave. They were taken by an American process. Mr. Hannaford made some remarks on this and other similar processes, in which he proposed adopting a slightly different principle to the one usually employed, and greasing the stone first, and then coating it with the sensitive coating. After exposure and fixing, the greasy surface would be left in a fit state to receive the printing ink. A communication was next read from Dr. Hill Norris, on "Dry Collodion Processes." The author first discussed the causes of *blistering* and *stripping-up* of the film; the former, he stated, resulted from the expansion of the preservative substances, and the latter from the presence of too small a quantity of preservative gelatine or albumen. As remedies, he recommended, if the film were inclined to blister, a diminution in the strength of the albumen or gelatine; whereas, if the film had too little adhesion to the glass plate, the strength should be increased. The employment of meta-gelatine was stated to give rise to stained plates and liability to strip off, although it was easier to manage. The next subject treated of was the sensitiveness of the dry plate; this was stated to be uninfluenced in a direct manner by the presence of nitrate of silver or organic salts of this metal. A sensitive collodion plate simply washed and dried was stated to be the most sensitive of all *dry* plates; next to this, and nearly as good, came those prepared with gelatine or albumen. The doctor next entered into some explanation of the chemical composition of the sensitive silver salt. Here, however, Dr. Norris's chemistry does not serve him so well as his photography; instead of admitting candidly that we do not know the real cause of the variations in sensitiveness of iodide of silver, he attempted to explain it, by assuming that the ordinary sensitive iodide of silver was composed of equal equivalents of iodide and nitrate of silver; that the insensitive iodide of chemists was composed of equal equivalents of iodide of silver and iodide of potassium, and that the precipitate produced by adding excess of iodide of potassium to nitrate of silver was a biniodide, containing two equivalents of iodide to one of silver. The error of assuming that bodies in which chemists, with all the delicacy of the present analytical processes, can only detect the elements Ag and I, with sometimes a mere trace of extraneous matter, consist respectively of

$$Ag\,I + Ag\,O.N\,O_5$$
$$Ag\,I + K\,I$$
$$Ag\,I_2$$

is very serious, and tends greatly to weaken one's respect for the other branches of science in which Dr. Norris speaks so authoritatively. On the subject of the retention of the invisible image, the author stated that dry collodion plates possessed the singular property of gradually returning to their original condition if kept in darkness for some time after exposure. Damp and other causes facilitated this return; and various chemical vapours also had a deleterious effect on the plate, and thus it was not advisable to delay development longer than absolutely necessary. Under the head of development, the author stated, that, with inferior plates, gallo-nitrate gave more certain results than pyrogallic acid. With the latter developer, five minutes was stated to be the greatest length of

time which should be spent over this part of the operation. The employment of ammonia in the collodion, in order to bring about the desired porosity or rottenness of the film (as recommended in the present number of the "PHOTOGRAPHIC NEWS," p. 233), was spoken of very favourably. Dr. Norris stated that the collodion modified in this manner should contain more iodide and pyroxyline than usual. In conclusion, the necessity of conducting the development in a moderately warm room was insisted on; and in cold weather, artificial heat was recommended to be applied to the plates and solutions. After the reading of this communication, a discussion took place in which the credit of having suggested the existence of the above-named silver compounds was claimed for Mr. Maxwell Lyte by Mr. Shadbolt. A paper was next read by Mr. Hannaford, "On an iron printing process." This is a modification of the *ink process*. Paper is first floated on a solution of bichromate of potassa, ammonia, citrate of iron, gum arabic, and sugar. After exposure, the picture is to be fixed by soaking in water, and then toned and developed; this latter part of the process is one which somewhat entitles it to the attention of photographers, inasmuch as many tints may be produced: gallic acid gives a warm, sepia tint; chloride of gold, applied previously, gives a purple colour; ferrocyanide of potassium gives a blue picture; and salts of manganese, copper, uranium, &c., each gives a picture having a peculiar tint.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

AT the last meeting of this society, Dr. Haines read a paper on the "Uses and Abuses of Photography." He pointed out in detail the various valuable and useful applications of the art: such as portraiture and landscape photography: its application to various branches of the physical sciences, to police purposes, &c.; and then proceeded to detail the various abuses of the art. Under this head he classed the appropriation of the title "photographic artist" by persons who had no knowledge of art or science; cheap portraits, 2d. being mentioned as the price at which photographic portraits might be obtained at some places, 6d. extra being charged for colouring them. The indecent and demoralising pictures, on which the "PHOTOGRAPHIC NEWS" has recently been obliged to animadvert in strong language, were mentioned as another abuse of the art; as also was the habit of Sunday vending which it engendered amongst photographers. As remedies to the above state of things, the author urged the formation of photographic societies, holding periodical exhibitions, reading papers before the Birmingham Photographic Society, and contributing pictures to its album. Mr. Edwards remarked that the practice of pirating photographs, and selling reduced photographic copies of them, was an "abuse" of the art which called for suppression: one or two notorious instances of such piracy were mentioned.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

AT the last meeting of this society, Mr. Taylor read a paper on "Discoveries in Photography." This paper was little more than a history of the art, with a mention of the names of the principal discoverers, alphabetically arranged. Starting from Daguerre, Niépce, and Talbot, whom he placed in the foremost rank, he enumerated their principal discoveries, and then strung together a very heterogeneous mixture of persons, who would, doubtless, be much surprised to find themselves in each other's company. He concluded by stating that the *ink* process offered one of the most glaring cases of *re*-discovery. It originally belonged to Beauregard; it was then *re*-discovered and patented in this country a year after publication of the process; then *re*-discovered and published as new after the lapse of another year; and lastly, it was again *re*-discovered and published as new a few months ago.

Photographic Notes and Queries.

DEAD BLACK FOR BRASS WORK.

[We have received from numerous correspondents, whom we take this opportunity of thanking, letters on the above subject in answer to our inquiry at p. 228 of the "PHOTOGRAPHIC NEWS." From them we have chosen the following, as containing the most useful information.]

The dead black for brass work is easily prepared, by dissolving shellac in methylated spirits of wine, and adding thereto a little vegetable black. I do not know the exact proportions, but it is not important; bearing in mind, however, that with too much shellac you will get a glossy black, which is objectionable, and that with too little the preparation will not properly adhere. J. H. B.

Procure 1½ oz. of native black, put it on a level stone, rub it into a fine powder, mix it up with turpentine, and grind it very fine (the same as painters grind their colours), then put it into a pot and pour on to it ½ oz. of japanners' gold size, mix it well up, and it is ready for use; it may be put on with a camel hair pencil; will dry in five minutes, and be quite hard in one hour.

If the colour is too black, you may add a little bronze green powder to it, and it will be more pleasant to the eye. The above ingredients may be bought at any colour or chemist's shop; the black is in lumps, in the shape of a sugar loaf. J. B. B.

The dead black used by the best opticians is simply composed of *very finely ground* lamp black mixed with lacquer, and applied *cold*. The work should be previously dipped in dilute acid, to remove all trace of greasiness. To work on which a black surface is required, without the necessity for absolute deadness, bichloride of platinum is used, being applied with a small brush. After a sufficiently deep tone is obtained, the work should be washed in clean water, dried, and brushed with a soft jeweller's brush, previously passed two or three times over a cake of black lead. It may then be lacquered in the ordinary manner or not, according to what may be required. W. H.

The best dead black for brass work that I have been able to obtain (after trying the lamp black with spirit varnish, as recommended in No. 1 of "PHOTOGRAPHIC NEWS," which I found to fail, as also did *lamp black* with 20 other mediums) is (viz.): *best black japan* (not the ordinary japan) carriage varnish, thicken with finely ground *drop black*, on a glass or marble slab, then thin with turpentine: the proper consistency will quickly suggest itself; apply with camel hair brush.

I have found this, as a dead black, to be all that can be desired, viz.: hard, quick drying, will not rub off or shine on friction of cloths, leather, or hands. F. W. EVANS.

CEMENTED GLASS DISHES.

SIR,—If my limited experience is of any value to your correspondents, it is at your disposal. I have made several glass baths, and have had one in use above nine months; it seems to answer every purpose. It is cemented with *Collins's elastic glue* in the following manner:—First grind or make rough the parts to be cemented with emery and water on a flat surface; then make the pieces tolerably hot on a stove (or in any other way); slightly melt the end of the glue at the fire, and rub it on the edges; press them together, allowing the sides to project a little over the ends; let them remain still until cold, then fill up the end with glue; put the bottom on the same way, allowing it to project a little. Should it at any time become leaky, you can slightly heat the part, and it will re-cement itself. The glue is sold by leather-sellers, or where things used by shoemakers are kept. G. C.

GLASS DISHES.

SIR,—I was very glad to read the letter from Mr. George Eddowes at p. 214. In common with many of my photographing friends, I have frequently complained of the wasteful, expensive, and unnecessary width, and slovenly make, of the present class of glass baths. I have tried all the best shops in London, but can find nothing different from

the usual rough, short, and *absurdly wide* glass baths. Well-made, and nicely-shaped porcelain and gutta-percha baths are to be had, and why not glass ones also? which photographers much prefer. It will be a great boon to amateurs if the attention of the glass trade be called, through your columns, to this desideratum.—I am, Sir, your obedient servant, HENRY BONUS.

GELATINE PAPER.

SIR,—On reading, in vol. i. p. 205 of the "PHOTOGRAPHIC NEWS," "Suggestions for the Employment of Gelatine Paper in Photography," another use for it occurred to me, viz., to line the whole or part of the window of my operating room with dark orange-coloured gelatine paper in place of the yellow calico I have used hitherto, which constantly fades. The following queries suggest themselves:—

1. Would it not be about a tithe of the price of coloured glass?
2. Would it not be as effectual in excluding the chemical rays, at the same time admitting sufficient light?
3. Would there be any fear of its fading or curling up under the influence of the sun's rays?
4. Where can it be obtained, and what is the price of it?

R. O. F. S.

ANSWERS TO MINOR QUERIES.

GLAZE FOR PAPER POSITIVES.—Our esteemed correspondent, who answered an inquiry on the above subject in our fourteenth number, p. 167, has forwarded some stereograms, glazed as there recommended. We have carefully examined them, and compared them with highly-glazed pictures by other artists, and have no hesitation in recommending the process to our readers as being capable of producing as glossy a surface as may be desired.

DIRTY YELLOW APPEARANCE ON POSITIVE PRINTS.—*Amateur* has tried the positive-printing process, given at p. 86 of the "PHOTOGRAPHIC NEWS," with much success, the tints, when first put into the water after toning, being nearly perfect; but sometimes during the washing the paper turns of a dirty opaque yellow colour when looked through. This appearance is frequently met with in all the usual printing processes, and is caused by the hyposulphite of silver, which is formed in the pores of the paper when first immersed in the hypo. bath, not being dissolved out by the hyposulphite of soda, and then, in the subsequent operations, decomposing spontaneously with the formation of sulphide of silver, which remains in an insoluble form in the pores of the paper. Knowing the cause, the remedy is obvious:—Increase the strength of the hypo. bath, and allow the print to remain for a longer time immersed in it. We have also found that soaking the print in a solution of one pound of common washing soda in a gallon of water, between the toning and fixing bath, to be very effectual in preventing the occurrence of these stains, whilst it in no way interferes with the ease or certainty of the other parts of the process.

NEGATIVE DEVELOPING SOLUTION PREPARED WITH IRON.—*J. H. B., W. H. W., and others.* The following is Mr. Hardwich's formula for the above solution, referred to by "An Amateur" in a previous number of the "PHOTOGRAPHIC NEWS:"—

Protosulphate of iron	12	grains.
Acetate of soda	6	"
Beaufoy's acetic acid	1½	drachms.
Water	6½	"

PREPARATION OF PURE PROTOSULPHATE OF IRON.—*W. S. B.* Boil dilute sulphuric acid and iron together until the acid is saturated; boil the liquid with iron filings in a narrow-necked flask till the crystallising point is attained, and strain through a filter moistened with water, into a vessel rinsed out with a little dilute sulphuric acid. The sulphuric acid prevents the filtrate from becoming turbid. The funnel must have a very long neck, reaching to the bottom of the vessel. The crystals, as they form, are left to drain upon a funnel, then rolled backwards and forwards between bibulous paper till they no longer wet it, and dried upon paper at a temperature not exceeding 80°. When well dried, they remain permanent for a long time in dry air, and for a tolerably long time in damp air.

TO CORRESPONDENTS.

☞ Some complaints having been made by our subscribers as to the non-receipt of the "PHOTOGRAPHIC NEWS," the publishers beg respectfully to notify that every care is taken on their part to insure punctual and correct dispatch. All complaints should, therefore, be made to the Post Office authorities.

H. E. N.—We are sorry you stated that your letter was not intended for publication, as there was much interesting and valuable matter in it. May we make some selections and insert them in the "PHOTOGRAPHIC NEWS?" We think that if the question you raised in the former part of your letter was fairly discussed, it would prove of great interest.

A. B.—Perhaps gum benzoin dissolved in benzol, would answer the purpose of varnishing glass positives, so as to make the powder colours bite properly.

F. W. E.—Thanks for the information. We will look more carefully at your pictures.

T. BARRETT.—We are obliged for the suggestion as to the black varnish. Other correspondents, you will see, have however suggested plans which will answer all the purposes desired.

P. LOUIS.—1. The blank front is for an extra lens. 2. We will see if we can give a description of it. 3. A twin lens camera.

A. E. X.—The thickness of the glass must be allowed for either in focussing or some other way. In working with the calotype in the open air, it is customary to take several camera backs, each containing two sheets of sensitive paper; in default of these, the papers can be changed in a dark bag thrown over the head and shoulders, or by candlelight in any dark corner of a cellar or out-house. We have always met with the greatest civility at farm-houses when we have asked for the requisite accommodation, - in many instances refreshment being courteously offered us.

W. C.—We cannot endorse your opinions that the redeveloping solution in the alabastrine process necessarily destroys the half tones of the picture, and causes it to tarnish in a few months.

NEVA.—Some of our best pictures have been taken in the open air, in the shadow of a wall or tree.

J. F. L.—We cannot help you more than by recommending you to advertise for the kind of situation you want.

W. H. W.—We cannot imagine the cause of the discoloration you speak of; does it not disappear in the fixing bath? Many thanks for the information in your note; we will avail ourselves of it. We shall be very pleased to see the views you promise to send.

H. N. T.—The picture is a very bad one, and looks as if it had been sensitised in an alkaline bath. Add acetic acid to the nitrate bath.

PYROGALLIC ACID.—Use an old collodion and the following developing solution: Pyrogallic acid, 3 grains; glacial acetic acid, 1 drachm; alcohol, 1 drachm; water, 1 ounce; and fix with hyposulphite of soda. We shall be very pleased to receive an account of your exhibition. Please forward it at your earliest convenience.

T. SMITH.—The fault you mention is a very common one, and requires great skill to overcome. Try exposing for a little longer time.

A. B. C.—We think it will do, but you had better try it, as it is so simple.

F. J.—1. The cause of the mark on your collodion plate, the shape of the pneumatic holder, is owing to the unequal evaporation of the ether, the part over the holder evaporating in a different ratio from the rest. 2. Common water may be used as you propose, but there is a little liability to stains. 3. Gum arabic has been proposed as a varnish for collodion pictures, but the objection is, the injury done to it if wetted.

CAPTAIN, R.A.—We prefer a square camera. The direction of the longest side of the plate can always be managed by inner frames to the dark slide. We cannot recommend any place to buy glass. Most large houses would allow you to pick it out yourself, or would change scratched plates.

J. W. W.—Your plan of printing is as good as those in ordinary use, but not so good as the one given at p. 86. The colour of the inclosed print is bad, but the negative is good.

AN AMATEUR.—The process is not a good one. See answer to J. W. W.

T. S. SHEARD.—We have never tried the lenses you name, and so would not like to give an opinion. They are not, however, considered very good. A portrait combination will answer best for copying and enlarging.

H. DOUBLEDAY.—Received with thanks, but too late for examination.

F. H. W.—You received *lunar caustic* instead of proper fused nitrate of silver. Evaporate it down to half its bulk, and use it for printing.

P. Q.—We cannot help you further than by recommending you to obtain catalogues of powder colours from all who advertise, and purchase from those which contain the proper tints. Each maker gives the tints a different name and number.

CLERICUS.—We intend to complete the first volume of the "PHOTOGRAPHIC NEWS" in 26 numbers; it will have a full index. We will think over your other suggestions. Will you, in the mean time, assist us with your experience in the different processes?

J. H.—If the spot be merely an opaque substance in the glass, or an air bubble, it will not hurt; but, if there be veins in the glass, they might interfere seriously with the definition.

N.—We suspect your bath is in fault; add acetic acid to it. Try the plate cleaning solution, described at p. 156.

D. F. L.—1. The lenses must be parallel. 2. We do not quite understand your query, but there would be no difficulty in getting what you want.

W. REID.—We know nothing more of the *light* but what is published in the "PHOTOGRAPHIC NEWS."

P. M.—1. We know of no likely cause for the spots you refer to. 2. Try gelatine paper or the "crystal medium," as advertised.

E. PEPPER.—Your solution for cleaning plates is pretty good; but inferior to the one given at p. 156.

W. WOODFORD.—Received with thanks. In our next.

Communications declined with thanks:—F. A.—A Printer.—Uranium.—H. A. P.—Pyroxyline.—H. G.—Camera Stand.—L. M. N.—X. Y. Z.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "PHOTOGRAPHIC NEWS:"—Difficulty.—A Subscriber.—A. Q.—Patience.—Old Phos. P. A. A.—S. E. R.—Ross.—H. T. F.—Galileo.—Δ.—Positive.

IN TYPE:—Viator.—T. B.—E. P.—C. A.—H. S. I.—An Amateur.—E. H.—W. D.—Eusebius.—C. R.—A. E. X.—H. C. R.

*** All editorial communications should be addressed to Mr. CROOKES, care of Messrs. Cassell, Petter, and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 21.—*January* 28, 1859.

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.*

On the subject of composition, we have often expressed an opinion in these pages that it was scarcely applicable to photography: and up to the present time, we see no reason for changing our opinions;—on the contrary, we find that what we have so often said on the subject, is fully endorsed by many of the best art critics in the country. Composition, properly, is of that class which Rejlander introduced by his picture of the "Two Ways of Life," and which Robinson has subsequently so successfully followed.

In large pictures composed of several negatives, there is a great amount of tact and ingenuity required, which is not so necessary when the picture is taken at once. In the Exhibition this year there are very few large compositions: we find that there are new faces in the field, while the old champions of composition are barely represented. We may here state, that it is with great regret we learn that Mr. Robinson has been extremely ill during the last few months; and to this we may attribute the fact that he has nothing new in the present collection. As we have already noticed his productions at great length on previous occasions, we do not feel called upon to do more than merely name them here; the chief are—"Fading Away," "She never told her Love," and the "Red Riding Hood" series. It is rather surprising to find so few pictures here by Rejlander. His compositions are smaller and less ambitious than his "Two Ways of Life;" he is extremely happy in catching the peculiarities of low life, and is very successful in rendering them. But when we see low life in all its broad features, as it actually exists, we see how it differs from the clever conventionalities with which some good artists invest it in comic journals. As an instance of the undesirableness of representing things as they really are, we may mention his composition of one of the characters in the "Seven Ages of Man" (2), the subject illustrated is—"The Infant Mewling and Puking in the Nurse's Arms;" this selection is not at all happy. When this subject is treated by the artist and draughtsman, the grosser characteristics are toned down, while in the photographic composition we have merely the unpleasant picture of the child literally fulfilling the poet's description. While looking at this picture in the exhibition-room, we overheard a lady criticising it, and she seemed to embody in a few words a most expressive and a most emphatic criticism when she uttered—"What a disgusting picture!" Such, we conceive, would be the expression of many. The picture "Well?" (154) is that of an old pedagogue listening to the scholar as he stumbles over his imperfectly-learned lesson. The expression of the old man as he mends his quill, listening to the broken utterances of the boy, is inimitable, while the unhappy look of the pupil is admirable. The "Scripture Reader" (183) is perhaps a more interesting subject than any of the others: the idea is thoroughly English, and will, we fancy, appeal to the feelings of many; though in carrying out the conception, there has not been a sufficient unanimity on the part of the models to enable the artist to do justice to his idea. The old man scarcely represents the character of a listener, while the old woman appears too intent upon her spinning. As to the arrangement of the interior, it bears all the marks of Rejlander's ingenuity, and the play of the lights and shadows is admirably given. Should any amount of success ever be attained in this department of the photographic art—we scarcely think it ever will—we must look upon Rejlander as the first who gave an impetus to it.

Of all the perpetrations we have ever seen in composition, we think we must give Truefit Brothers credit for having executed some of the worst. They are very bad photographs, and as compositions—if such a term can be applied to them—they are really ridiculous. These artists have attempted by means of photography to give us some pictures of country life. This, as all our readers know, is a class of subjects which finds great favour, both with artists and the public generally. But the pictures by Truefit Brothers have neither sentiment nor form in them; indeed, there is an absolute absence of that naïve simplicity which is the charming characteristic of pictures of rural life. The reason of this is plain, and it is one of the strongest arguments against composition in photography. There can be no doubt but that the models are genuine country children; but then, as photographic models, they are told to assume a class of sentiment which it is impossible for them to understand or appreciate, and which, as a matter of course, they fail to personate. To meet with anything like success, they should be subjected to many months' training ere they attempted to represent anything. "The Granny's Lesson" (10) is not the thing the title implies; it is simply an old woman sitting outside of a wooden shed, by the side of whom there is seated a child with its arms stiffly placed on the "granny's" knee, and with an expression of face that rather portrays a consciousness of having his likeness taken, than that which the piece is intended to illustrate. "A Shady Bank" (14) is similar in character and treatment to the other; a more correct title, however, would have been "A Hazy Photograph." Maudlin stupidity reaches its climax in the "Queen of the May" (23), "The Rivals" (29), "The Rejected" (35). As to the "Queen of the May," we cannot say much for the ideal attempted by this simpering representative of majesty. As to "The Rivals" and "The Rejected," the idea is simply absurd, and the *poses* and arrangement of the figures are more like bad stage conceptions, than scenes from actual country life. And so we might go on *seriatim*, without meeting with one good feature in any of the series by these artists. However, we will only notice two more: "The Young Fisher Boys" (191), "The Village Pump" (200). Until we obtained a catalogue, we could not conceive what the picture, "Young Fisher Boys," was intended to represent. From the peculiar angle at which the legs of one of the boys were placed, we concluded that it was a scarecrow attached to a pole for the purpose of frightening away birds, but the representation of something very unlike water corrected this. At last, puzzled with conjectures, we were forced to consult the catalogue, and found that the title was as we have described. "The Village Pump" is so badly printed, and so ill-arranged, that we will not waste time in noticing it. Our object in mentioning them at all, is to show the necessity for having real artists to conceive and work out the arrangements of compositive pictures. It cannot fail to strike the reader that the titles selected are such as would at once attract the attention of the curious; and, in the hands of such artists as Rejlander or Robinson, the subjects might have been adequately represented: from the foregoing remarks, we need hardly inform our readers, that Truefit Brothers have failed to do this.

Then Fenton has been tempted into this department, and,

* Continued from page 231.

for a "first appearance," his pictures are not so bad, still they are not such as please us. With regard to the arrangement of dress and interior detail, there can be no doubt that Fenton is the one who ought to be well able to give us a correct idea of the household economy of the Orientals. Still there is one thing which does much to spoil the whole of these studies, and that is what we have repeatedly urged on those photographers who attempt to illustrate eastern manners and customs, viz.: the necessity of having real national types as models. If these compositions are to be of any use, let us at least have associated with the dress the physical characteristics of the nation; and let the physiologist have equal chance with the *costumier*. In the very clever photographs of Turkish character, which W. M. Grundy exhibited some time ago, the very same defects were apparent that are to be seen in Fenton's pictures. In these pictures, Fenton has not succeeded in overcoming the difficulty of copying from expressionless models,—a difficulty to which we have often alluded in connection with this subject. A most amusing circumstance, in connection with his picture of the "Pasha and Bayadere" (46), is the fact that one of the "tricks" which enables the composer to produce an effect is too palpable. It is, indeed, "A Peep Behind the Scenes." If the visitor will very closely inspect this picture, he will find that the strings, which are intended to hold up the hands of the female figure, are plainly to be seen. This is a peculiar defect in many of Fenton's compositions: the figures have not been able to keep their hands quite still while the picture was being taken. In the picture "Returning from the Fountain" (59), everything has been sacrificed, as far as background effect goes, in order to catch the figure. This is to be regretted, as it spoils the picture. "Nubian Water Carrier" (608) is the best of these series, the only defect is a little mistiness about the hands; altogether, we may congratulate Mr. Fenton on his first attempts.

(*To be continued.*)

ON THE CAMERA OBSCURA.*

BY PROFESSOR PETZVAL, OF VIENNA.

The advantage of a diaphragm before the lens is, that it can be placed so as to admit only those rays of a cylinder whose intersections correspond to that part of the caustic which is situated in the plane of the picture. In order to convert a telescopic lens into a tolerably good camera lens, the cylinder of rays which corresponds to an image near the edge of the field must be treated in the manner described, and the position of the diaphragm determined accordingly. With a lens 3 inches in aperture, and a focal length of 16 inches, such as was in general use in the early period of daguerreotyping, the diaphragm is best placed at a distance of 3 inches before the lens, its aperture being 1 inch. The image thus obtained, although tolerably good, will not be of uniform sharpness; in the centre it will perhaps bear magnifying three times, whilst at the edges it will barely admit of examination with the naked eye. In point of sharpness, therefore, this picture is at least three times inferior to one of the cameras already used as a term of comparison. With respect to illumination, the superiority of the ordinary modern camera is still greater, for since the degrees of illumination are directly proportional to the squares of the apertures, and inversely proportional to the squares of the focal lengths; the ratio in question is 1 : 19 nearly. It must be noted, however, that the modern camera has four more reflecting surfaces than the old one; by which means almost one-fifth of the light is lost, and the above ratio diminished to about 1 : 16.

The substitution of an achromatic in place of an un-achromatic object-glass is, beyond comparison, the most important step in the improvement of the camera; for not only have the properties of sharpness and illumination been thereby increased—the former in the ratio of 1 : 7, and the latter even in the ratio of 1 : 40—but the serious defect of separated optical and chemical foci has been remedied. Besides this, the image has become nearly plane, a result which, it is true, might also have been obtained in the case of an un-achromatic lens by means of the same method of blinding. Lastly, the field has become almost universally lighted; the not very broad zone of diminishing intensity of light which still exists, is due to the blinding. As diaphragms often produce this defect, it will be well to examine their action more closely.

Around the centre of the lens, and with a radius of 1 inch, conceive a circle to be described: its circumference will be at the distance of half-an-inch from that of the lens. The diaphragm at the distance of 3 inches having an aperture of 1 inch, all cylinders of rays passing through the same will be entirely received by the lens, provided their axes are within or upon the circumference of the above circle, and the corresponding images will possess the maximum intensity of light. The rays of every cylinder whose axis meets the lens in the circumference of the circle, are inclined to the axis of the instrument at an angle of 18°; consequently, everywhere within a field of 36°, the image possesses full intensity of light. Again, only one half the rays of those cylinders whose axes exactly graze the edge of the lens will be admitted by the latter, the entrance of the rest being prevented by the brass mounting. These rays are inclined at an angle of 26° to the axis of the instrument, so that between 36° and 52° the intensity of light in the field will diminish from its maximum value to one-half of the same. Lastly, the lens will admit none of the rays of the cylinders whose axes meet its plane at a distance of half-an-inch from its edge; consequently, between 52° and 66° the intensity of light diminishes from half its normal value down to zero. Thus when uniform light is required, the field must not exceed 36°; in other words, the focal length being 16 inches, the diameter of the circular picture cannot exceed 10 inches.

Such are the properties of the instrument with which Daguerre worked when he made his beautiful discovery. At that time silver plates coated with iodine were alone employed; and the time of exposure required was so great—half-an-hour, that portrait-taking was next to impossible. Hence arose the demand for a camera-lens producing greater illumination, and equal, or, if possible, greater sharpness. Sooner or later practical opticians would, no doubt, have sought to improve the camera of Daguerre by substituting a convex-concave in place of the plano-convex achromatic lens; for the former, treated in the manner above described, possesses several advantages. Science, however, stepped in with more efficient means, and Professor Petzval, after a thorough theoretical investigation of the subject, set about constructing his first object-glass, destined principally for portrait-taking.

In so doing he was guided by the following considerations:—The object-lens of a telescope has only three conditions to fulfil: *first*, to possess a given focal length; *second*, to be achromatic; and, *third*, to reduce the spherical aberration to a minimum.

In the camera, however, the number of the conditions is raised from three to eight, five of which have reference to a much more complete destruction of spherical aberration, two to the production of achromatism, and the eighth to the position of the focus. Instead of three, therefore, eight optical elements are requisite, the choice of which will be determined by the following considerations:—Greater illumination, one of the desired improvements, can only be obtained in two ways—by enlarging the aperture, and by diminishing the focal length, both of which, however, will result from employing two converging lenses instead of one. These lenses must of course be achromatic, and, by theory, in order that a good image may be produced, they must be separated from each other by a distance of not less than one-third of the focal length of the lens next the object. In order to form the eight requisite elements, therefore, seven

* Continued from p. 230.

lens surfaces and one distance may be selected. By this selection the first lens need but present three surfaces to be disposed of, so that its constituents may have a common surface. The second lens, however, in order to furnish the remaining four surfaces, must have its constituents separated, even though by so doing light is lost.

In accordance with these data, Professor Petzval calculated a new object-lens which had an aperture of 1½ inch, and a focal length of 5½ inches. With it portraits were taken in forty seconds; in point of illumination it was sixteen times superior to the camera of Daguerre, and its images were sharp enough to bear magnifying twenty times. The principal defects of the new camera were a curved image, and limited field of view, both of which resulted from the employment of separate lenses.

With respect to the first defect, the image of a plane object was, according to theory, situated in the hollow of a paraboloid of rotation, having its vertex a radius of curvature equal to 7 or 8 inches. In object-glasses afterwards constructed, where the aperture was increased to 3 inches, this curvature was softened to 15 inches. By sacrificing a little sharpness at the edges, too, circumstances generally furnished means of softening this curvature still more.

The second action of the separated lenses deserves closer examination. It will be at once seen that here the setting of the first lens plays the part of the former diaphragm, and modifies the admission of light to the second lens. As an example, let us take an object-glass whose two lenses are 5½ inches apart, the aperture of each being 3 inches. Let the focal length of the first lens be 16 inches, and that of the second 24 inches. Then, by means of the first lens, a cylinder of rays parallel to the axis becomes converted into a cone, whose vertex is 16 inches behind this lens; and the plane of the second lens intercepts this cone in a circle whose diameter is diminished to 2 inches; the same is true approximately for every other cylinder inclined to the axis of the instrument. Around the centre of the second lens, therefore, let us conceive a circle of ½-inch radius described; its circumference will be at a distance of 1 inch from that of the lens, and it is clear that the second lens will admit all the rays of every cylinder whose inclination to the axis of the instrument is such, that the axial ray of that cylinder, after passing unrefracted through the first lens, meets the second in the circumference of the above circle. The image produced by such a cylinder, therefore, will possess the same maximum of illumination as do the central images. But the entrance of the rays of other cylinders more inclined to the axis of the instrument will be more or less impeded; and, by following the method already explained in the case of Daguerre's camera, it will be found that throughout a field of 10¾° there will be maximum light; that between this and a field of 32° the intensity of light will diminish to half its normal value; and, lastly, that the whole extent of the field, beyond which is darkness, amounts to about 50°. These angles correspond on the pictures to circles whose diameters are 2, 6, and 10 inches respectively.

When portraits only are to be taken, that is to say, when a correct picture of only a small portion of the object is desired, this unequal distribution of light is of no great importance. In the case of landscapes, maps, engravings, &c., however, it forms a serious defect, and necessitates the use of diaphragms, not only to distribute the light more uniformly, but also to diminish the influence of unequal distances of objects, and to soften the curvature of the image. The best place for the diaphragm is exactly midway between the two lenses, and by diminishing the intensity of light to ¼th, ⅓th, or to $\frac{1}{18}$th of its full value, the field of equal illumination may be increased to 31°, whilst the two zones, wherein the light first diminishes to half its normal value and then to zero, may be made much narrower.

The modifications applied to the old instrument to fit it for its new purposes, had for their object, principally, to increase the magnitude of the field and the uniformity of its illumination, and consisted in a diminution of the distances between the two lenses, and of the aperture of the second. The object-glass, constructed carefully with a view of fulfilling all the new conditions, and submitted to the Academy of Vienna, consists as before of two lenses; the first has an aperture of 3 inches, and the second of 2 inches, the clear distance between the two being 1 inch. The magnitude of the picture is the same as that corresponding to a single achromatic lens of 26 inches, focal length, its diameter being 20 inches; in other words, the field amounts to 42°, and is uniformly lighted. This last result is due to the diminished aperture of the second lens, and has been purchased, of course, at the expense of intensity of light. The curvature of the image of a plane object is small, its radius at the vertex being about 80 inches.

With respect to the achromatism of the two lenses, it is well known that the ratio between the indices of refraction for crown and flint glass is not constant, but varies with the colour of the ray, and that, on this account, the rays of all colours cannot be made to coincide simultaneously by any arrangement of the two kinds of glass; in other words, according to the technical expression, a certain chromatic aberration of the secondary spectrum always remains. In the telescope, most attention is paid to the coincidence of the rays at the red end of the spectrum, and without injury to the picture a considerable aberration of the rays at the violet end may exist. These rays, however, exert the greatest chemical action, whence it happens that the object lens of a telescope gives a less sharp photographic, than optical, image. On the other hand, if the opposite end of the spectrum were most attended to, the photographic picture would be improved at the expense of the optical one, and in both cases the chemical and optical foci would be separated. In constructing the new object-glass, the whole spectrum, rather than either end of it, was regarded, and the most active chemical made to coincide approximately with the most active optical rays, so that, for a healthy eye, the chemical and optical foci coincide.

From the above exposition, it follows that, whilst the new camera is inferior to the old in point of illumination, it far surpasses the latter in magnitude of the field, and in uniformity of sharpness, as well as of illumination. Whilst the new camera, therefore, is best adapted for landscapes, the old one may still be used whenever a brief period of exposure is desirable, as in taking portraits, or pictures of living animals.

GENERAL OBSERVATIONS ON PHOTOGRAPHIC POSITIVE PROOFS.*

BY MM. DAVANNE AND A. GIRARD.

ON SENSITISING—(*continued*).

Of the Influence of the Strength of the Bath—(*continued*).—Let us now endeavour to ascertain to which of the two elements present this rapid impoverishment is owing.

If a sheet of paper be taken without any preparation, and submitted to the nitrate of silver, and afterwards washed repeatedly in distilled water, and, finally, exposed to the full glare of the sun, it presents only a feeble colouring; and as the silver bath is not altered in any appreciable manner, we may conclude that the paper itself is without influence, and that it takes from the bath only the quantity of silver proportionate to the quantity of liquid it absorbs.

It is not the same with the albumen. Let us take a sheet prepared with this substance, pure, without addition of soluble chloride, submit it to the nitrate of silver bath, then, having washed it several times in distilled water, expose it under a negative, and we shall see it produce a very clear and vigorous proof. If we test the strength of the bath before and after the passage of the sheet of paper, we shall find that the 100 cubic centimètres of water which previously contained 15 per cent. of silver, no longer contain the same proportion. We find that the quantity of liquid

* Continued from p. 221.

absorbed has been 8 cubic centimètres, which ought to have weakened the bath to the extent only of 1·20 gramme of nitrate, whereas, in fact, the albumen has taken up 2·65 grammes; consequently, the richness of the bath is reduced to 13·9 per cent. This fact also, which is an important one, will receive further consideration when we treat of the theory of insolation. But our analyses prove beyond doubt that the albumen deprives the bath of a large quantity of nitrate with which it combines.

Gelatine and starch do not lead us to similar results; it is well known that neither the one nor the other gives with the nitrate of silver an insoluble combination, and if both influence, as we have no doubt they do, the value and colouring of the proof, it is by combinations which form eventually, or under the luminous influence, and which, in any case, never affect the proportions of the nitrate bath.

We have now to examine the part played by the chloride from the point of view under consideration. Experiments made on paper salted in a solution at 5 per cent., without additional sizing, and manipulated in the manner described above, give this result:—that a sheet of paper 44 × 57 placed in contact with a bath measuring 180 cubic centimètres, and showing a richness of 12·82 per cent., robbed the bath of 3·10 grammes of silver, together with 10 cubic centimètres of liquid (the paper, not being albumenised, was more porous, and absorbed a greater quantity of liquid). These 10 cubic centimètres correspond to 1·28 gramme of nitrate of silver, therefore 3·10 − 1·28 = 1·82 gramme have been absorbed by the paper in the condition of chloride. The difference here, as is evident, is much less than when the paper is both salted and albumenised; it is, to all appearance, equal, and rather superior to that which the albumen alone produces.

Thus, then, the chloride and the albumen concur in the impoverishment of the bath in consequence of the formation of two insoluble combinations, and the porosity of the paper accelerates its diminution. One may say in general terms, that a sheet simply salted impoverishes the bath to a certain extent, and that a sheet both salted and albumenised impoverishes it to twice that extent. The first two causes alone need occupy the photographer, because they change the richness of the bath, and, by consequence, the results; and since, as we said at the beginning, the rule of this impoverishment cannot be stated in an absolute manner, but merely the method according to which it operates, we cannot too strongly impress on photographers the advisability of adopting this method of testing their baths, which alone can save them from the causes of error we have particularised.

Of the Time of Contact with the Silver Bath.—We have inquired what influence the length of time during which the paper is floated on the silver bath can have on the bath. The paper imbibing a greater or less quantity according to the time of contact, it appeared *à priori* evident that the absorption of free nitrate of silver would be greater as the time of contact was prolonged, and this has been confirmed by experiment.

A contact of one minute does not suffice: in this period the whole of the soluble chloride can scarcely be converted into chloride of silver; hence, relative insensibility, streakiness, and spots in the designs. Five minutes give a very good result; fifteen furnish a proof verging a little more on black than the preceding. We thus return to the preceding example; and it is established that a more prolonged sojourn in the bath corresponds to an augmentation of richness in the paper, and, consequently, to an augmentation of clearness in the proof—within a certain limit, of course. Five minutes may be considered the normal time; and if, to modify the proofs furnished by a negative, the operator desires to alter the richness of the proof by a stay of greater or less length in the bath rather than by using baths of variable richness, this should be considered the fixed period around which to oscillate.

(To be continued.)

ON CASEINE FOR PHOTOGRAPHIC PURPOSES.

La Lumière contains the following on the subject of a process discovered by M. Duchochois, (and given at p. 183 of the "Photographic News,") for substituting caseine for albumen in the preparation of negatives, after the Taupenot method.

Caseine being unknown to a great many photographers, we will briefly make them acquainted with its properties, and teach them a very economical method of preparing and preserving it.

Caseine constitutes the azotized part of the milk of mammiferous animals, in which it is held in solution by a small quantity of potash. Cheese is almost entirely composed of it.

Although M. Duchochois has given instructions for preparing soluble caseine, we are bound to declare that *soluble caseine does not exist.* Caseine does not dissolve in water. For this to take place it must be accompanied by an alkali. In that case it is no longer caseine that is held in solution, but a *caseate.*

In his method of preparation he directs the precipitation of skimmed milk by means of sulphuric acid. Any other acid will give the same result—we may mention more especially hydrochloric acid and acetic acid, which every photographer possesses in his laboratory.

After having washed the precipitate on a filter, first with acidulated water, and secondly with pure water, we advise its solution in a little carbonate of soda or common salt, substances much better known than carbonate of barytes, and which may be easily and cheaply procured anywhere. Sal ammoniac may be employed just as efficaciously, and also nitrate of potassa and iodide of potassium, bodies with which photographers are already familiar.

After filtering, the solution must be evaporated. This solution on contact with the air gradually becomes covered with a pellicle, insoluble in both acids and alkalies, and in the salts just mentioned. It is this pellicle which is formed on milk when heated. When all the liquid has evaporated, the caseine presents itself under the form of an amber-coloured amorphous mass, without smell, and of an insipid taste. Its solution is coagulated by alcohol and acids. All the earthy and metallic salts precipitate it. With chalk, or better still with lime, it gives an insoluble compound, which is employed in painting in distemper, as well as for preparing a mastic susceptible of receiving every species of painting and impression.

It is under the form of caseate of lime that caseine can be best preserved, and we cannot too earnestly call the attention of photographers to this fact. When it is desired to disengage the caseine required for use, it suffices to digest some bits of the caseate of lime in hydrochloric acid or vinegar. The operation must be conducted in such a manner that a little of the salt shall remain undissolved. The liquid must be filtered, and the precipitate washed with care, and applied to the purpose for which it is intended at once—as otherwise it will very likely happen that the whole of the caseine prepared will be lost; for this substance easily putrifies, and becomes transformed into a variety of products, with the liberation of an insupportable odour.

The following method gives caseate of lime most abundantly and economically. Take white cheese and heat it with a solution of carbonate of soda, in such a way that after a contact of several hours there shall be a little cheese in excess. Filter it, and pour into this liquid a solution of lime, obtained by the immersion in water of a small quantity of slaked lime. An abundant white precipitate composed almost entirely of caseate of lime will be obtained. This precipitate is laid on a cloth, and washed with abundance of water, and left in the air to dry. When dry, it is preserved for use as required.

The composition of caseine is the same as albumen. In 100 parts by weight, it contains, according to Dumas and Calwin:

Carbon	53·50
Hydrogen	7·05
Nitrogen	15·77
Oxygen	23·68

EXHIBITION OF THE FRENCH PHOTOGRAPHIC SOCIETY.

THE French Photographic Society organises its third exhibition, in a special department of the Palace of Industry, of photographs and works connected with photography in any of its branches. It invites both native and foreign photographers to send pictures, under the following conditions:—

1. The opening of the Exhibition will take place at the Palace of Industry on the 1st April; and it will be closed on the 15th June following.
2. Pictures for exhibition must be delivered, with all charges paid, to M. Martin Laulerie, rue Drouot 11, between the 1st and the 15th March.
3. The exhibitor should send a note at the same time, stating the number of objects sent.
4. Exhibitors must protect their pictures by means of frames or passe-partouts.
5. All coloured proofs will be excluded, as well as those which give evidence of having been "touched" in such a way as to modify the photograph properly so called, by manual operations.
6. Exhibitors are requested to append their name and address to their work.
7. The mention of the nature of the negative process employed, whether it be dry or wet collodion, albumen, &c. &c., is obligatory; and any additional information will be received with pleasure.
8. Nobody will be allowed to fix the price at which he would sell his work, but he may communicate it to the secretary, who will hold such information at the service of the public.
9. No picture can be removed until the closing of the Exhibition.
10. The jury appointed for the purpose will decide what pictures shall be admitted to the Exhibition.
11. Pictures must be removed within a week after the closing of the Exhibition.

Critical Notices.

The A B C of Photography. Tenth edition, with additions, including recent improvements in the Art. London Stereoscopic Company.

WHEN we wish to express our ideas of simplicity, the most usual way of saying it is—"Oh! it is as plain as A B C." The work is quite in accordance with the title, as it is in reality an A B C of our art. In the introduction, the author, in the most patronising manner, informs us that he "will not rake up his Greek." Fortunately he does not, as he thereby spares us a great infliction. The account which the author gives of the system of photography is clear and understandable. The hints on the Positive process contained in the opening chapters, entitled, "Preparatory Arrangements," "Coating the Plate," "Making the Plate Sensitive," "Exposure of the Plate," and "Developing the Plate," are such, that if the amateur only observes them he is almost certain to achieve a success. Should he, however, meet with failure, by consulting the chapter of causes and effects, entitled, "Failure with Glass Positives," he will be almost sure to meet, in this summary, some of the laws which he has failed to observe. What we have said of the author's treatment of the positive process, is equally applicable to the other branches treated of. In fact, as a simple introduction to photography, this book, in the hands of a beginner, would be the "right book in the right place." It has one great advantage over many similar treatises, viz., that absence of pedantic technicalities, which are only understood by those deeply versed in chemical and optical science.

Stereograms of English Scenery. By W. WOODWARD, Nottingham.

THESE stereograms illustrate some of those charming little nooks and corners of rustic scenery with which this country abounds. In his selection of sites, Mr. Woodward has been exceedingly happy; and when he has attempted to photograph historically interesting places, he has evidently been guided with great artistic taste in giving the best view that could be obtained. The process by which they are obtained is the collodio-albumen; and, judging from those before us, we doubt not but that they are among the best specimens which have yet been obtained by it. The scene in "Burghley Park, Stamford," is a very fine picture; and the photographer has, in the most successful manner, given true effect to the water, while, at the same time, a great amount of definition has been obtained, not only in the background foliage, but also in the detail of the foreground. The most successful architectural slide is that of "Newstead Abbey." His lane scenes are very pretty, and would, we doubt not, be of great use to an artist as studies of rustic scenery. The great feature of the series is, equality of tone, and careful manner of treatment.

Lessons on Colouring Photographs.

COLOURING POSITIVES ON GLASS—(*continued*).

Chromo-Photographs.—This term has been used to designate a class of pictures in which the colours are made so to permeate the collodion film that, when viewed from the opposite, or glass side, the tints are sufficiently brilliant, presenting a non-inverted coloured picture. In using this designation to describe these pictures, we must not be understood in any way to indorse the appellation, which is inappropriate and misleading. We refer to it, because we believe the term and the process have excited some interest amongst our readers. To describe the method of producing this result, we cannot do better than quote a paragraph from a valuable work just published,* and then add some observations of our own.

"The mode of producing this result is simple, and when well done presents somewhat the effect of enamelling on glass. It depends, in the first instance, however, on the collodion film being permeable; this is sometimes the case in ordinary positives taken with a collodion, the pyroxyline of which has been made at a high temperature, thus giving a powdery film. This permeable film, however, is best obtained by the 'Alabastrine Process;' and the best specimens we have seen of the non-inverted coloured positives have been produced by it. The picture having been varnished and coloured—and, if necessary, varnished and coloured again (a little extra care being used to obtain brilliancy in the carnations)—is to be varnished once more with a 'penetrating varnish,' provided for the purpose, which has the effect of projecting the colour thoroughly into the collodion film; the result is, that the positive then viewed from the glass side presents a picture as vividly coloured as on the collodion side."

In attempting to apply this process to ordinary collodion positives, certain conditions must be remembered. Photographers are aware that, amongst the various classes of glass positives—all good enough of their kind—there are two possessing very distinctive features. The first is in many respects somewhat allied to a negative in character; its intensity is obtained by a thick deposit of reduced silver in the lights. In the second, intensity in the lights is obtained by purity of colour in the reduced silver; the deposit is thin, but of a pure white. A picture of the latter class—the collodion being also powdery or porous in texture—is best suited for permeating with colour so as to produce a non-inverted picture. As is stated, however, in the above extract, by far the finest results are produced by applying the process to alabastrine photographs. The colouring is proceeded with as we have described in former chapters, with powder colours; remembering throughout, however, that the tint of the colours used will be somewhat modified by the final coating of "penetrating varnish." The nature and extent of this modification can only be learnt by expe-

* "The Principles and Practice of Harmonious Colouring, especially as applied to Photographs." Published at the "PHOTOGRAPHIC NEWS OFFICE," and by Newman, Soho-square.

rience—in some colours the modification being in depth, and in others in tone. Some of our correspondents have recommended the use of turpentine as a varnish for producing these pictures. We would, however, caution our readers against its use; for, in addition to producing very imperfect results, it is sure, eventually, to spoil their pictures, by becoming discoloured and yellow. These pictures should always be taken on colourless glass, and should be backed with velvet.

This method of colouring is peculiarly adapted to uniforms, in which it is important that the various ornaments should not be inverted as regards right and left. We have found it possible to obtain a very perfect scarlet coat by using this method on an alabastrine photograph.

COLOURING PAPER PHOTOGRAPHS WITH POWDER COLOURS.

Paper photographs are most frequently coloured in water or oil colours, and of the method to be pursued we shall speak in the proper place. Very fine results, however, may be produced by the skilful colorist through the use of powder colours, and with this advantage over the other methods we have named—that the picture retains all its photographic characteristics; it remains a tinted photograph: whilst in using water or oil colours it often happens, that the photograph becomes merely the basis on which to paint a picture—more or less of the photograph being obliterated at every stroke of the brush. The use of powder colours, however, renders imperative the possession of a photograph perfect in all respects to work on, as little or nothing can be added with the pencil, except colour, to the already existing light and shadow.

Albumenised paper prints are most commonly used for this purpose, although plain paper may be used if the surface be treated with a sizing preparation to which the colours will adhere. The picture should be mounted on cardboard, and, if possible, passed between steel rollers or hot pressed. The colours are then applied in the same way as in colouring glass positives; we must, however, be careful to apply the tints of the required depth at once.

If the photograph be not quite so perfect as we have stated it should be—that is, if it possess some black shadows quite destitute of detail and drawing—there is even here a succedaneum to which the colorist may resort. With the point of a knife the surface of these black shadows may be slightly abraded, in such a manner as the drawing may require. To these half-lights, thus "taken out," the proper dry colour is then to be applied; it will be found to adhere perfectly. Instead of "taking out" lights in this way, they are sometimes carefully stippled on with body colour, and the dry colour then applied over it. These methods are more applicable to landscapes than to portraits.

(*To be continued.*)

Photographic Chemistry.

CHEMICAL MANIPULATIONS—(*continued*).

Decantation.—When the precipitate is very heavy, and lies closely at the bottom of the vessel, the method of washing employed is decantation; this is the mode in which the chloride or iodide of silver is washed: all that is necessary to accomplish this is to pour off, or decant, the liquid, and then to pour on fresh, repeating the operation as often as may be necessary. After pouring on each quantity of water it should be well stirred with a glass rod; and, the substance being washed, allowed to settle thoroughly before any attempt be made to decant the liquid. The operation may be repeated eight or ten times.

To perform this purification of insoluble substances properly, distilled water should be used; but, generally speaking, filtered water will answer the purpose, provided that the last two or three washings are made with distilled water. One thing to bear in mind in this process is, that it is advisable not to be in a hurry.

Analogous to this mode of washing substances, is that employed in obtaining powders of great and uniform smoothness, termed *levigation.* A fine powder, say the tripoli powder used in cleaning glass plates, for example, is placed in an upright glass vessel, which is filled up with water and violently agitated; it is then placed on a table, when the heavier particles fall to the bottom, leaving the finer portions in suspension. The upper portion of the liquid containing the latter is poured off into a filter; and it is manifest that this powder will be free from coarse particles which would scratch the plate.

Evaporation.—The object of this operation is to separate a solid body from its solvent,—that is, when the latter can be driven off in a state of vapour. The evaporation is said to be spontaneous when the liquid disappears of its own accord: we may illustrate this by taking a drop of a salt solution and letting it fall on a smooth surface; the liquid will gradually evaporate, and the salt will be restored to its original condition. Evaporation may be assisted by the liquid being placed in a vacuum; or, as in the ordinary method, by heating the solution to boiling point. When there is no object in collecting these vapours, the operation is performed in an open vessel; but when it is desired to preserve them, it is conducted in a perfectly air-tight vessel, fitted with a long neck, which passes into the neck of a similarly shaped vessel: the operation is then termed—

Distillation.—The object being to separate a volatile body from a solid, or a volatile body from one less volatile, and at the same time to preserve both. The bodies to be separated are placed in one of the vessels and maintained in a state of ebullition; the vapour generated, having no other outlet, passes along the neck of the vessel into the second retort, which is kept cold by immersion in water or ice, according to the nature of the substance undergoing distillation, and condensation occurs, the vapour trickling down the sides of the vessel in the form of a liquid.

Concentration.—A solution is said to be concentrated when a part of the solvent is evaporated, and the proportion of the body dissolved to that of the solvent is thus rendered greater: when a fresh quantity of solvent is added, the solution is said to be *diluted.*

Sublimation.—This operation is analogous to that of distillation, but is applied to bodies that pass at once from the condition of vapour to that of a solid; such as iodine, and sal ammoniac. These bodies are heated in an air-tight vessel, and the portion vaporised or sublimated rises to the upper part of the vessel, and is condensed therein.

Heating.—The mode of heating is almost a matter of indifference; it may be accomplished either by means of the spirit lamp, charcoal, or gas; the rule to be observed in its application only requiring that it shall be gradual, otherwise the fracture of the vessel containing the substance, and the loss of the substance itself, will be probable consequences. The thinness, which should be the same throughout, is a matter of special importance in the choice of a glass vessel for these manipulations; and the heat should be so applied that it shall not act on any part of the vessel except that which is covered by the liquid; this is easily managed by placing a tile above the fire with a hole perforated in the centre, in which the flask is placed.

Fusion.—What we understand by fusion is, the passage of a solid body from the condition of a solid to that of a liquid by the application of heat; as in the case of lead, silver, &c. A distinction must be drawn between *aqueous* fusion and *igneous* fusion: aqueous fusion is the dissolution of a solid in its water of crystallisation, igneous fusion is its liquefaction after the water has left it; for example, crystallised carbonate of soda, exposed to heat, first undergoes aqueous fusion, then it loses its water of crystallisation and becomes solid again, and by the application of a more intense heat it is made to undergo igneous fusion.

(*To be continued.*)

Dictionary of Photography.

ARGENTOMETER.—An apparatus by which the quantity of silver present in any solution can be tested. The simplest method of effecting this is the following:—

Prepare a solution of 32 grains of pure chloride of ammonium in 12 ounces of water; 1 drachm of this solution will, therefore, precipitate 1 grain of nitrate of silver. Measure out very carefully a known quantity of the bath to be tested (2 drachms for instance), place it in a 2-ounce phial, and add a few drops of nitric acid. Now measure out exactly 1 drachm of the solution of chloride of ammonium, and add it, by a few drops at a time, to the silver solution in the bottle, corking it up and shaking violently between each addition, until a white precipitate is no longer produced on the addition of another drop of the test solution. If, before this is accomplished, the first drachm of test solution be exhausted, carefully measure out a second drachm, and so on until the desired point is attained. When finished, the number of drachms of test solution used will indicate the number of grains present *in the phial*. Thus, supposing 2 drachms of the nitrate bath had been placed in the phial, and it required 7½ drachms of test solution to precipitate the silver, that would have shown that the 2 drachms of bath contained 7½ grains of nitrate of silver, or 30 grains to the ounce.

ASPHALTUM.—A substance also known under the name of Jews' pitch, mineral pitch, or compact bitumen. It is found in abundance in several localities, especially near the Dead Sea, and the famous *pitch lake* in Trinidad. It resembles in appearance common pitch, sinks in water, melts easily, and is very inflammable, burning with a red smoky flame. Asphaltum is a body of great interest to the photographer, as it was one of the substances used by M. Nièpce in the early days of the art, for the purpose of preparing a coating sensitive to light. The process was called by the inventor Heliography, and is thus described in his own words:—I about half fill a wine glass with this pulverised bitumen. I pour upon it, drop by drop, the essential oil of lavender till the bitumen can absorb no more. I afterwards add as much more of the essential oil as will cause the whole to stand about three lines above the mixture, which is then covered, and submitted to a gentle heat until the essential oil is fully impregnated with the colouring matter of the bitumen. If this varnish is not of the required consistency, it is to be allowed to evaporate slowly, without heat, in a shallow dish, taking care to protect it from moisture, by which it is injured, and, at last, decomposed. A tablet of silver is to be highly polished, on which a thin coating of the varnish is to be applied cold, with a light roll of very soft skin; this will impart to it a pure vermilion colour, and cover it with a very thin and equal coating. The plate is then placed upon heated iron, which is wrapped round with several folds of paper, from which, by this method, all moisture has been previously expelled. When the varnish has ceased to simmer, the plate is withdrawn from the heat, and allowed to cool and dry in a gentle temperature, and protected from a damp atmosphere. The plate thus prepared may be immediately submitted to the action of light in the camera. But after exposure nothing is apparent to show that impressions exist. The forms of the future picture remain still invisible. The next operation, then, is to disengage the shrouded imagery, and this is accomplished by plunging the tablet into a solvent consisting of one part, by volume, of essential oil of lavender, and ten of oil of white petroleum, until the operator, observing it by reflected light, begins to perceive the images of the objects to which it has been exposed gradually unfolding their forms, and, though still veiled by the supernatant fluid, continually becoming darker from saturation with varnish. The plate is then to be lifted out, held in a vertical position until as much of the solvent as possible has been allowed to drop away, and then carefully washed under a stream of water. This process was very uncertain and tedious, as exposures of six or eight hours in the camera were required. Further experiments of MM. Nièpce and Daguerre soon modified and improved it, until, ultimately, the latter gentleman discovering the beautiful process which bears his name, the original Heliographic process of Nièpce was forgotten. Latterly the nephew of the original discoverer, M. Nièpce de St. Victor, has drawn public attention to this process on account of its applicability to the purposes of obtaining photographic etchings upon steel. The surface of the steel plate is first to be carefully cleansed with whitening and water, then very dilute hydrochloric acid is to be poured over, when the plate is to be immediately washed and dried. A mixture of asphalt with a small portion of pure wax, having been dissolved in equal parts of oil of lavender and benzol, is to be poured on the plate in a darkened chamber, which is then to be dried carefully. The prepared plate then, having been exposed to the light underneath a good positive photograph, is to be submitted to the action of a solvent consisting of three parts of naphtha and one of benzol: where the light has not acted, the varnish is dissolved by this mixture. After this solvent has proceeded far enough, the plate is washed off with water, and the exposed parts are bitten in with a mixture of 1 part nitric acid, 2 parts alcohol, and 8 parts water. The plate may then be printed from in printers' ink, in the ordinary manner.

A modification of this process has been applied to lithographic purposes; in this case the prepared varnish is poured upon the lithographic stone, a negative photograph is then to be placed upon it, and exposed to the light. After submitting the stone to the action of an appropriate solvent, it is washed, treated with a dilute acid, and again washed; after which it may be used for printing with ordinary lithographic ink, which attaches itself to the parts upon which the asphaltum is left.

These processes have now been superseded by others, in which Mr. Fox Talbot's discovery of the action of light upon "chrome-gelatine" is more or less appropriated by experimentalists, and published by them as the basis of a *new discovery.*

(*To be continued.*)

A Catechism of Photography.

FIXING THE IMAGE.

Q. What is the next process after the development of the image?

A. The plate must be thoroughly washed in order to relieve it from any particles of silver which may still remain upon the surface. After being thoroughly washed, the impression is "fixed."

Q. What solution is used in fixing a collodion picture?

A. For this purpose two dissolving agents are used, namely, hyposulphite of soda and cyanide of potassium.

Q. How is the hyposulphite of soda used?

A. A saturated solution of hyposulphite of soda being placed in a bath, the plate is immersed in it. The yellow tint of the iodide of silver gradually disappears, and the picture, in all its beauty and purity, is brought out. It must then be taken from the bath, and fresh water copiously poured over it; after this it must be allowed to dry.

Q. How is the cyanide of potassium employed?

A. A solution is made in the following proportion:—

Cyanide of potassium	2 parts.
Water	100 parts.

When applied to the surface of the collodion plate the action of the cyanide of potassium upon the iodide of silver is exceedingly rapid. As soon as ever the yellow tint is removed, which it will be in a few seconds, the plate must be instantly removed, and thoroughly washed—being placed in a bath of pure water, or else having fresh water poured upon its surface.

Q. What plan is adopted when the image on the plate is but feebly developed?

A. Instead of removing the iodide of silver, it is necessary to destroy its sensitive action. This is done by applying to the plate a solution of bromide of potassium, a solution of persulphate of iron, or a solution of common salt. Thoroughly washed with this solution, the plate is allowed to dry. Plates so preserved generally give impressions of great softness, but in procuring positives from them considerable time is necessary, as it is difficult for the light to penetrate the yellow coating of the iodide of silver.

VARNISHING THE PLATE.

Q. How would you describe the picture produced according to the foregoing rules?

A. As a *negative* collodion picture.

Q. Why should it be described as a *negative?*

A. Because it is intended for the purpose of reproducing other pictures; and consequently all its blacks and whites are reversed, so that, in the impression taken from it, they may have their natural position and effect. A picture of this sort is called a *negative;* and those which are taken from it are called *positives.*

Q. When the collodion negative is fixed and dried, is it liable to change?

A. The collodion film is very liable to injury, and it is therefore necessary to protect it by some further process.

Q. How is such protection to be given?

A. By covering the surface of the glass plate with varnish.

Q. What varnish is used for this purpose?

A. Some photographers simply employ a solution of gum arabic, which dries rapidly upon the plate. Others prefer albumen, which they apply to the picture while still wet, and which they allow to dry after passing the aceto-nitrate of silver bath, which coagulates the albumen.

Q. Are not other sorts of varnish occasionally used?

A. Yes; both spirit and turpentine. Spirit varnish dries rapidly, and is therefore more useful when expedition is necessary in the completion of the process. Turpentine varnish will take forty-eight hours to dry. Amongst the preparations employed are the following:—

Copal varnish	1 part.
Benzoin	2 parts.

Or—

Gum benjamin	10 parts.
Spirits of wine (36 above proof) ...	100 parts.

Or—

Gum lac	8 parts.
Spirits of wine (33 above proof) ...	100 parts.
Essence of lavender	16 parts.

A varnish formed of gum amber, dissolved in chloroform, is also used. This varnish is exceedingly durable, but is proportionately expensive. The gum amber should be thoroughly macerated, and mixed with chloroform and ether in equal parts, thus:—

Gum amber	5 drachms.
Chloroform	20 drachms.
Ether	20 drachms.

Q. How is the varnish to be applied to the plate?

A. The back of the plate should be held to the fire until it is thoroughly warm in all parts, but not hot. The varnish is then to be poured on just in the same manner as the collodion, the superfluous liquid being returned to the bottle. The plate, for a short time, may then again be held to the fire, and thus a perfectly even and beautifully polished surface is given to the picture.

SUMMARY OF THE COLLODION PROCESS.

Q. Having been thus particular in these various receipts, succinctly re-state the collodion formulæ. How is the collodion prepared?

A. We have furnished the receipts for two different processes. First:—

Rectified sulphuric ether	1½ ounces.
Gun cotton	16 grains.

Shake, and add to

Spirits of wine (40 above proof) ...	6 drachms.
Iodide of cadmium	11 minims.

Shake, and allow to remain for twelve hours before using.

The second method is—

Rectified sulphuric ether	1½ ounces.
Gun cotton	16 grains.

Shake, and add to

Spirits of wine (40 above proof) ...	6 drachms.

With

Iodide of potassium	1 grain.
Iodide of ammonium	1½ grains.
Iodide of cadmium	1½ grains.
Bromide of potassium	15 minims.
Bromide of ammonium	30 minims.
Bromide of cadmium	30 minims.

Mix in a mortar; add the collodion; shake well together; and allow to settle for four or five days.

Q. What materials are employed in cleansing and polishing the glass?

A. The following mixtures are very good for this purpose:—

Water	500 parts.
Carbonate of potassa	100 parts.

After using the above, the plate should be washed and dried, and then finally polished with rotten stone, nitric acid, and water.

Q. How is the nitrate of silver bath composed?

A. In the following proportions:—

Nitrate of silver	1½ drachms.
Distilled water	2½ ounces.

Q. What solution is employed in the development of the picture?

A. The following solution is found to work well:—

Pyrogallic acid	16 grains.
Citric acid	8 grains.
Distilled water	6 ounces.

Or—

Saturated solution of sulphate of protoxide of iron	2½ ounces.
Water	10 ounces.
Acetic acid	3½ drachms.
Spirits of wine	3½ drachms.

Q. How is the picture to be fixed?

A. Either by a solution of hyposulphite of soda, or a solution of cyanide of potassium. Thus:—

Hyposulphite of soda	6 drachms.
Water	2½ ounces.

Or—

Cyanide of potassium	3½ grains.
Water	2½ ounces.

Q. What is recommended as a varnish for the collodion?

A. Either spirit or turpentine varnish will serve for this purpose; the former, as we have already noticed, drying with much greater facility than the latter, and on this account more generally employed.

(To be continued.)

Correspondence.

PHOTOGRAPHIC QUACKERY.

Sir,—The votaries of photography are occasionally the victims of so much quackery and humbug, that it becomes a duty to expose every instance that occurs to us; and I feel certain that such instances would be of rarer occurrence, if the editors of Photographic Journals would aid the duped and defrauded amateur to show up the authors of such disgraceful trickeries. I was, therefore, much pleased to find you had come to the assistance of the correspondent, whose letter appears at page 225, and I am sure I do not stand alone in thanking him for writing, and you for inserting his

communication. Your having done so encourages me to expose a similar instance, of which, about three months ago, I was the victim. I had observed an advertisement, which all last summer had appeared in the columns of one of your contemporaries, offering, for half-a-crown in postage stamps, "a first-rate formula for developing solutions for positives, quick in its action, producing brilliant and clearly defined pictures, far surpassing the generality of photographs." The address was not one hundred miles from Dover; the discoverer of this admirable formula modestly concealing his name. Being, at the time, about to take the portraits of several friends and relatives in the country, it struck me that a solution which would enable me to produce pictures "far surpassing the generality of photographs," was just the thing I ought to have, and I, therefore, inclosed the prescribed fee in a letter. By return of post I received the precious formula, and, eagerly opening it, read as follows:—

"FORMULA FOR DEVELOPING SOLUTION FOR POSITIVES.

Protosulphate of iron	2½	drachms.
Nitrate of potash	1½	„
Common water	7	ounces.
Glacial acetic acid	3½	drachms.
Alcohol	3½	„
Nitric acid	4	drops.

Fix with cyanide of potassium.
Use ———'s collodion."

Judge of my astonishment on finding that I had been purchasing a formula almost identical with that which I had been using ever since I took my first lesson in positive portraiture. The advertiser had, in fact, sent me the common protonitrate solution, with rather an excess of glacial acetic acid and alcohol, and four drops of aquafortis! I at once saw that I had been taken in, and that, too, in the coolest manner. I had nothing whatever for my money, except the information that I might continue as I had gone on, fix with cyanide of potassium, and use ———'s collodion! Very satisfactory, and very gratifying! I mentally vowed never to become the dupe of another similar advertisement, and your numerous readers will do wisely to make a similar resolve. C. ALVYN.

SPONTANEOUS RESTORATION OF DRY COLLODION PLATES.

SIR,—I have been much startled by reading a paragraph in vol. i. p. 238 of the "PHOTOGRAPHIC NEWS," wherein it is stated to the "North London Photographic Association," from a communication read before them from Dr. Hill Norris, on "Dry Collodion Processes," viz., "On the subject of the retention of the invisible image, the author stated that *dry collodion plates* possessed the singular property of gradually returning to their original condition if kept in darkness for some time after exposure." This leads me to suppose if by any accident light should be admitted to dry collodion plates, though it would spoil them for immediate use, yet by keeping them in the dark for some time after, the plates would return to their former state: would you or any of your numerous correspondents kindly give me a reply to the following questions?—

1. How long would it be before a dry collodion plate would return to its original state, after exposure, if left in the dark?

2. Would the plate be available for taking another image?

3. If light be accidentally admitted into a box containing dry collodion plates *for a very short time*, will those plates be entirely spoiled, or will placing them in the dark make them again useful? DURHAM.

Photographic Societies.

CONVERSAZIONE OF THE HALIFAX LITERARY AND PHILOSOPHICAL SOCIETY.

THE annual meeting of the Halifax Literary and Philosophical Society, and also a *conversazione* devoted exclusively to photography, were recently held in the Museum. As the latter was the more attractive of the two, we condense the business report into a small compass. The president, J. Waterhouse, Esq., not being yet sufficiently recovered from a recent severe illness to attend an evening meeting, the chair was taken by Jas. Stansfeld, Esq. The report of the past year, which was read by J. E. Norris, Esq., stated that, owing to the almost unanimous voluntary increase of the subscriptions of the members last year, the debt then due had been discharged; but that the expenditure of the society (some of it from extraordinary causes) had, during the past year, exceeded the income, and an appeal was therefore made to the members to canvass for new subscribers. Owing to this deficiency of income, and also to the fact that, under the existing arrangements, no less than 3,633 visitors had been admitted free to the Museum during the past year, with subscribers' orders, the council had declined an application made to throw the Museum open to the public. Several valuable additions had been made to the Museum, for which the council thanked the contributors. Amongst those which we have not previously noticed, are about fifty specimens of Peruvian minerals, by J. Waterhouse, Esq., and several interesting Chinese articles, by E. Luscombe, Esq., War-office.

The officers for the ensuing year were then elected; the only change from the previous list being the election of E. Akroyd, Esq., M.P., and John Lister, Esq., Shibden Hall, to be vice-presidents; and the substitution in the council of Jno. Abbott, Esq., and Mr. Stott, for Dr. Kenny and Jas. Riley, Esq.

The following gentlemen were ballotted for, and elected new members:—E. Haigh, Esq.; J. E. Sowerby, Esq., The Hollins; Mr. Jones, surgeon; and Mr. Christopher Rigg.

And now for the *conversazione*, for which considerable alterations had been made in the arrangement of the room, and in its lighting. The wall cases were all covered with drapery for the display of the larger photographic works; the tables placed down the centre of the room so as to furnish glass-casing for smaller articles, were surmounted by a rail for the reception of framed photographs. Every space was occupied, and that without the display of a single inferior specimen. Thanks to the combined taste and munificence of the exhibitors, the photographs shown were of the best of their respective classes; so that, although as to extent the exhibition could not cope with some photographic displays in larger towns and cities, in universal excellence it would bear the most critical comparison with them. A brief reference to some of the specimens is all we can give without trespassing too much on our space.

Mr. W. Best, of Leeds, sent some exquisite photographs of well-known prints.

Mr. Lyndon Smith displayed his famous photographs of Heidelberg, the Rhine, and also of the porch of Adel Church, and the unfinished tower of Bolton Abbey, all taken by the wet collodion process.

Mr. W. S. Ward, on the other hand, showed three large photographs (two of Fountains and one of Kirkstall) taken by the collodio-albumen, or dry process; and the exquisite detail obtainable in the deepest shadows which this process, above all others, is capable of giving, may be commended to the notice of all ardent amateurs.

From Mr. T. W. Stansfield, Leeds, came several of his photographs of Whitby, Rievaulx, and Kirkstall Abbeys; of the three Saxon crosses in Ilkley church-yard, and of the Wharf, and the remarkable metallic-looking rock facing Bolton Abbey.

Mr. J. W. Ramsden, of Leeds, sent several fine transfers, from his negatives, of scenery in the Lake district, and at Bolton Abbey, and also several photographs of machines. Whilst the latter show how useful the art may become to all manufacturers; the former, especially in their sky effects, show what may be done towards making photographs works of real art as well as of sun-painting.

Mr. Waterhouse (the president of the society, whose services in the photographic art are probably better known everywhere else than in his own native town) sent no specimens. But there were exhibited by E. Haigh, Esq., some views—of Bowness, Bolton Woods, Sour Milk Ghyll—toned by Mr. E. Gregson, photographic artist of this town, by Mr. Waterhouse's new process, whereby it is hoped to secure permanency to these beautiful, but hitherto hopelessly fleeting, miniatures of nature. Mr. Waterhouse's formula, substituting alkaline gold, promises this great desideratum.

Mr. Gregson also exhibited his stereoscopic slides of Beacon-hill, Scenes in the Park, Nab Glen Fall, near Haworth (the favourite scene of Charlotte Bronte).

Mr. E. Gledhill, of Halifax, exhibited similar slides of his views of the Park, Shibden Hall, Beacon-hill tunnel, Mr. F. Crossley's Almshouses, and also a pic-nic scene which showed artistic taste in the arrangement.

E. Haigh, Esq., exhibited a large portfolio of his photographs, among which we must notice several large views of the statuary in the Park, several of Kirkstall Abbey, and many stereoscopic slides (one of Sour Milk Ghyll, rivalling the best productions of foreign artists); and, during the evening, Mr. Haigh exhibited De la Rue's valuable stereoscopes of the moon, &c.; also a number of microscopic photographs.

H. Salt, Esq., sent his photograph of his father's bust, at Saltaire, and several architectural views in Venice.

Mr. P. H. Wilkinson (besides contributing many stereoscopic and ordinary photographic cameras, slides, stereoscopes, &c.) sent a photograph of Mr. Joseph Durham, the sculptor of F. Crossley's statue, taken by Dr. Diamond.

J. B. Holroyde, Esq., sent his portfolio of photographs, amongst which were two large views of the picturesque old Shibden Hall.

Mr. Joshua Horner sent a large photograph by Bisson Frères, of the Hotel de Ville, Paris; Mr. Whitley several Venetian views, similar but in different tone to some exhibited by Mr. Salt, and also some views transferred from paper negatives (the calotype process), a sharply-focussed view of a Stone Well at Venice, showing every indentation of the weather, and an interesting view of the great Cathedral at Cologne.

Messrs. T. and W. Birtwhistle sent several copies of engravings, and White's original views in the harvest-field; and M. Schischkar some exquisite photographs of flowers. We come last to the varied and valuable contributions sent by E. Akroyd, Esq., M.P., which alone occupied more than half the space in the Museum. Amongst these were Fenton's Photographs of the Crimean War, taken under extraordinary difficulties, and published, alas! in such haste that they are already more than half faded away, and threaten to become soon wholly obliterated, —Maull and Polyblank's portraits of living celebrities, itself a gallery worthy a whole evening's attention,—copies of two of Raffaelle's paintings, and of Giotto's Dante,—H. P. Robinson's "Fading Away," a photograph from the life, which is perhaps the best composition scene ever photographed,—large views of the castle of S. Angelo, the Coliseum, the Arch of Titus, and St. John Lateran at Rome; the Ducal Palace and Bridge of Sighs at Venice; the Mer de Glace, Switzerland; the Temple of Neptune at Pœstum, and the exhumed Temple at Pompeii; four of Gustav le Gray's famous sea-pieces, wherein the foam of the broken wave has been caught and instantaneously fixed; many large views of Paris; some photo-galvanographs, *i.e.*, pictures printed from copper-plates engraved by the sun; and a photograph of G. G. Scott's monument to the late Sir C. Hotham, governor of Australia, showing how an architect may learn how the artists and workmen are carrying out his drawings, without the expense and time lost in a personal visit.

During the evening a paper on the art was kindly read by E. Haigh, Esq.

French Photographic Society.

At the last meeting of the French Photographic Society, M. Balard, of the Institute, in the chair, after the dispatch of some routine business M. Paul Perier announced, in the name of the committee of administration, that it had prepared regulations for the third exposition which is to take place in April of the present year. (See the present number of the "Photographic News," p. 245.)

The members of the commission charged to examine the pictures sent for exhibition are:—MM. Count Olympe Aguado, Bayard, Bertsch, Cousin, Edouard Delepert, Davanne, Leon Foucault, Hulot, Jeanrenaud, Lemaître, Count Leon de Laborde, Le Gray, Adolphe Moreau, Peligot, Robert.

M. Girard presented to the society sundry carbon proofs which had been forwarded to him by Mr. Pouncey, to which two printed notes were attached marked "not for publication." In accordance with the desire of Mr. Pouncey this note has been sent to the commission appointed to award the prize given by the Duc de Luynes.*

* *Luynes*, not *Layne*, as a contemporary persists in spelling it.

MM. Davanne and Girard presented a continuation of their paper on photographic positive proofs, and exhibited several pictures in support of their communication, and in return received the thanks of the society.

M. Marion then read a paper stating that he had manufactured an apparatus on a plan suggested by MM. Davanne and Girard, for preserving sensitised papers; and requested that the box might be sealed until a day or two before the next meeting, and a commission appointed to open the box then, and experimentalise on the paper contained in it, and inform the society of the result. He concluded by saying, "I have made these boxes in the simplest manner, in order that they may be vended at a low price, at the same time that they are perfect. I shall be able directly after the report of the commission to deliver to the photographer, not only conserving apparatus of different shapes, but likewise papers ready nitrated, and that he will only have to place in his frame, without modifying his ordinary method in any way. I may observe that the use of this apparatus will in no way interfere with the habits of the photographer, and that he will simply have to put the sheets in the box in the same way as he would put them in an ordinary portfolio; and it is equally easy to put them in or take them out at any moment."

MM. Bayard, Civiale, and Paul Gaillard, were named to report on the paper.

M. Frank de Villecholle called attention to the fact that M. Cognacy had presented a box for the same purpose to the society, but at the moment he was about to describe it the president reminded him that if he described it he could not patent it, upon which M. Cognacy retired.

M. Girard replied that he could find no entry of such invention at the patent office.

M. Quinet presented a collection of proofs to the society obtained by means of paper prepared in a peculiar manner, which might be kept several months before or after exposure without undergoing alteration. He did not reveal his process.

M. Davanne exhibited a portable photographic apparatus which he had had constructed by M. Koch.

M. Hermagis presented a paper on the subject of the stereoscope presented to the society in his name by M. Ferrier nearly twelve months ago.—*Condensed from the Bulletin of the French Photographic Society.*

Miscellaneous.

A Mr. Henry Coxwell, writing to a daily paper on the subject of exploring the interior of Australia by means of balloons, says:—"The expedition will be provided with a photographic apparatus to stamp with truthful and indelible outline a series of bird's-eye views, the indisputable correctness of which will be invaluable, with written records of passing scenes. Viewing calmly the danger likely to accompany such an attempt, I do not think it can fairly be pronounced greater than that which attends an arctic voyage, or any other which originates from a desire to attain useful knowledge by intrepidity and personal risk."

Photography in America.—In England we have already become accustomed to the announcement of photographic publications, there have been many valuable works published in the volume shape, and we have an Art Journal illustrated by means of photography; but as yet we have not had any application of the art in the "getting-up" of gift-books. By "getting-up" we mean that Christmas style of book, which is so well known for its beautiful binding, and engraved illustrations by book illustrators. As yet, English publishers have not attempted the illustration of books of this class by means of photography,—at least, to any great extent. Our transatlantic friends are to be first in the field, and, according to the New York special correspondent of an able contemporary, we are informed that a publishing house in that city is about to bring forward a volume which will, in the cant phrase of the day, inaugurate a new era for illustrated publications. The work which it is proposed to place before the public, is a collection of photographic illustrations to Longfellow's latest poem, "Miles Standish." The photographs, eight or ten in number, are from drawings by an artist of German origin, J. W. Ehninger, by name, who superintends the photographic process, and the

general arrangement of the novel work. His designs are admirably conceived, and pleasingly executed. The photograph lends, of course, that peculiar depth and richness to the picture, in which it excels the softest etching; and the artist who is to execute the copies, avows himself confident of their durability. "At least," he says, "they will last a generation;" and in America what more can be asked? The present is a most unfavourable season for this undertaking, as only five hours, at most, are available for the photographer, and every day of rain or snow brings us to a standstill. We shall look with interest to more extensive application of this means of illustration.

Photographic Notes and Queries.

TONING PAPER POSITIVES WITH PLATINUM.

SIR,—At p. 214 of the "PHOTOGRAPHIC NEWS," one of your correspondents, I see, wants some information upon the subject of toning with platinum instead of gold. M. de Caranza, a Frenchman, of scientific repute, who has been travelling for upwards of twenty years in the service of his government in Turkey, exposed, three years ago, some very remarkable pictures of Constantinople and other eastern cities. I believe they were all toned with platinum; and in the French journal *La Lumière*, of February 23, 1856, he favoured the public with the following formulæ:—The picture should be much overprinted, and afterwards immersed in a solution of 2,000 grammes of water, 1 cubic centimètre of chloride of platinum of about the density of syrup, and 30 grammes hydrochloric acid. After a few seconds' immersion the metallic parts grow black, and the whites brighten up. The picture is then washed; and it is advisable to change the water six or eight times, and to add a little chalk the fourth or fifth time, to neutralise whatever hydrochloric acid the paper might have absorbed. The subsequent washing to take place again in pure water. The picture is fixed in hyposulphite, 1 part to 6 of water. I have lately followed this method with decided success, and I think it has some very great advantages over the toning with gold; the general appearance of the picture after finishing being superior and less bluish, especially in the light parts. The results for albumenised paper are equally good, although I must candidly confess that I think them better for ordinary salted paper. It is true that this toning bath is not so active as one with gold; but I consider this an advantage, since the rapidity of action in a *new* gold bath frequently spoils the picture. (I always tone before fixing.) However, care must be taken not to leave the paper too long in the bath; ten or twelve seconds will suffice in ordinary cases, and if the effect be not very apparent to the eye, experience will show that the chemical change has really taken place so soon as the picture comes into the fixing bath, where it readily takes a most agreeable colour. To improve the general effect, I would advise to dry rapidly before a brisk fire, and to polish the picture, when mounted, with a mixture of wax with oil of spike. Thereby the details are shown far more distinctly, whilst I think the picture is preserved, in a great degree, against the deleterious effects of a generally wet climate, as yours and ours decidedly are.

If these observations seem of any interest to you, they are entirely at your disposal, for insertion in the pages of the "PHOTOGRAPHIC NEWS," I am further making experiments upon a dry collodion process (not of my own invention), which is very simple, and in the meantime leaves a film as sensitive as wet collodion. In a few weeks I shall be able to give you further information upon this subject, if you will allow me.

HERMAN L. T. HAAKMAN.

Amsterdam, January 20th, 1859.

[We beg to thank our correspondent for the above valuable information, and shall feel great pleasure in receiving further communications from him on the above or other subjects.—ED.]

THE RASPBERRY SYRUP PROCESS.

SIR,—Ere this I expected to have seen some account of the success of the raspberry syrup process, from some of your numerous correspondents. Having been so far disappointed, I venture to state that, in my hands, it has exceeded, not only all other dry processes, but much beyond my most sanguine expectations. In proof of which I beg to inclose positive prints from negatives, obtained last week in 35 seconds' exposure, with plates prepared just three weeks before. Also two from prints—"Christ Prophesying over Jerusalem," and "Chapeau de la Brigand." I do not send them as first-rate productions, but just to show what can be done with plates prepared with this syrup. The facility with which they are prepared, and the little liability of being spoiled, is a great recommendation; and I trust you will shortly give us, in the "NEWS," the experience and success of others.

In Mr. Sidebotham's late communication on the collodio-album process, he states that—"It is well in all cases to expose sufficiently long, as an over-exposed picture can be made good, but an under-exposed one cannot." Pray will you be kind enough to explain more fully the first part of this paragraph, as to how an *over-exposed* picture can be made a good one? for I have generally found that the exposure required for the dark shadows of a landscape materially injures the light parts.

By slightly albumenising the plates, and drying them before collodionising, they appear to withstand any amount of washing, &c. M. P. M.

[The prints forwarded by our correspondent are very satisfactory.—ED.]

GELATINE PAPER.—YELLOW ILLUMINATING MEDIUM.

SIR,—I can assure your correspondent R. O. F. S. that yellow or orange-coloured gelatine will answer all the purposes of glass. I have tried the small yellow squares sold by grocers for confectionery purposes. Perhaps it is not generally known that a strong solution of gelatine poured on a bright smooth *tin* plate will release itself when dry, while if poured on glass it adheres tenaciously. I imagine that gelatine paper may be readily made by the former process, for the upper surface would necessarily be parallel with the lower, and equally bright and smooth.

For windows, however, its transparency would be objectionable—it should be ground as glass is, so as to diffuse the light. I should think that tissue paper painted on both sides with strong gamboge, which can be purchased in its raw state at the oil shops, would answer your correspondents' purpose; it should be varnished with the varnish sold for the imitations of stained glass on paper (I forget the name given), and with the same varnish it may be fastened to the glass. Gamboge will mix with oil or water, and perhaps if mixed with the varnish it might be less liable to bleach by the sun's rays. H. E. N.

GLASS BATHS.

SIR,—The way I have made my baths and trays with glass is, first of all to make a shell of wood, not liable to warp (mine is made of walnut), a little larger than required to allow for the thickness of the pieces of thin plate glass; the pieces of glass are then cut to fit inside of it as close as possible; I then pour inside a warm solution of gutta-percha; fit in my glasses, and make them bed well; when set, which will be in a very short time, I pour in a thin solution of shel-lac only along the joints to fill up crevices; and when nearly dry, finish them with a strong solution to make all neat. The pieces of glass are to be a little higher than the wood, to allow the solution to be poured out. These cemented glasses are more durable than the blown or cast ones that are bought, and a great deal more economical.

J. D.

GLASS ROOM.

Several correspondents having asked for information on the above subject, we shall feel obliged if some of our readers will favour us with particulars respecting the most convenient arrangement as to ground plan, fittings, elevation, and aspect; together with the estimated cost either with or without fittings.—ED.

ANSWERS TO MINOR QUERIES.

CHLORIDE OF AMMONIUM FOR THE SALTING BATH.—*Eusebius.* This salt is frequently used in the salting bath for positive paper, but, chemically speaking, it is not by any means the best substance to use, as, if the solution of chloride of ammonium in albumen be kept for any length of time, it liberates ammonia in sufficient quantities to be offensive, and as it thus becomes alkaline, the positive paper will be much deteriorated in its clearness and permanency. Chloride of sodium (common salt), or chloride of barium, is preferable; the objection sometimes made to the former on account of common salt being impure, shows great ignorance of chemistry: good table salt is sufficiently free from impurities for any photographic purpose, and if impure compounds *are* used, the impurities in chloride of ammonium are more liable to be injurious than those in common salt; moreover, it is absurd to be so over-scrupulous about the purity of any compound which is to be dissolved in a substance like albumen, which contains far more impurities than could possibly be present in table salt. The argument of economy, which is sometimes adduced in favour of the ammonium salt, on account of its containing more chlorine, weight for weight, than chloride of sodium, falls to the ground when we tell you that chloride of sodium costs as much per pound as chloride of ammonium per ounce; and as good printers do not advise the loading the paper with a superfluity of chloride, the slight saving in bulk is immaterial. We have thus given you, at your request, the *chemical* reasons for not preferring chloride of ammonium; but, at the same time, we must say, that several excellent formulæ for printing are to be found in our back numbers (for instance, at p. 86), in which the ammonium salt is used; and as these are successfully employed by many excellent operators, you can well imagine that it is not of so much consequence which you use, if you do not put the paper to very severe tests, such as long keeping in a damp place, or such like.

BLUE TINGE ON GLASS POSITIVES.—*O. R.* A correspondent has kindly informed us that the reason of the occurrence of the above stains is, the mixing of the developing and fixing solutions. If the plate be washed *thoroughly* before fixing, the tint complained of will not occur again.

THE PSEUDOSCOPE.—*A. E. X.* This is an instrument devised by Professor Wheatstone for effecting the *conversion of relief.* By its means the relative direction of rays reaching the eyes is inverted, and a corresponding impression of inverted relative position of different parts of an object is produced. The illusion is most extraordinary, a concave surface, as that of a bowl, appearing to be convex, and, *vice versâ*, a convex surface, as that of a globe, concave. It is formed of two rectangular prisms interposed between the eyes and the object, in such positions that the rays of light from any object in front being refracted at the first surfaces, then reflected internally at the backs of the prisms, and again refracted at their second surfaces, will enter the eyes in reversed positions, and thus the relative position of the rays will be inverted. Messrs. Bird and Brooke give the following interesting remarks on this subject:—"The delusive impression is not immediately produced in some individuals in whom the judgment appears for some time to contend successfully with the visual impression, but sooner or later the judgment gives way, and the object suddenly appears to be turned inside out; thus completely falsifying the old adage that 'seeing is believing,' for we are unable to resist the visual impression, although we know it to be erroneous."

PYROGALLIC ACID IN THE NITRATE BATH.—*H. C. R.* has accidentally spilled some pyrogallic developing solution in the nitrate bath, and consequently the latter will not work properly, but gives pictures covered with muddy streaks. The best remedy that we know of is, to expose the solution in a flat-bottomed dish to the full sun for an hour, and then to add water to supply that lost by evaporation, filter, and add a few drops of acetic acid if necessary.

TO CORRESPONDENTS.

☞ Some complaints having been made by our subscribers as to the non-receipt of the "PHOTOGRAPHIC NEWS," the publishers beg respectfully to notify that every care is taken on their part to insure punctual and correct dispatch. All complaints should, therefore, be made to the Post Office authorities.

We must beg our correspondents not to send glass plates through the post, except they are securely protected against breakage.

R. D.—Your negative arrived completely smashed. From an examination of the pieces we suspect the fault to be due to over-exposure in the camera.

E. M.—1. Try 4 grains of iodide of ammonium to the ounce instead of 6 grains. 2. Focal length 3½ inches, if by a *good* maker.

H. HAAKMAN.—1. The article you inquire about will shortly be advertised in our columns, by the gentleman who took the views referred to. 2. We are sorry we cannot give you the printing and toning process used; our own at p. 86 will, however, answer equally well. 3. *Papier Saxe* is sometimes used, but in any case the stereograms are glazed or varnished afterwards, in order to give them the gloss you speak of. We are much obliged for your communication, and shall be happy to hear further particulars.

X. Y. Z.—No; certainly not.

NEGATIVE.—1. The positive developer with iron may be used a second time, but it will not be so energetic. 2. Consult back numbers. 3. They will be inferior. 4. See p. 86. 5. Yes.

J. W.—We are sorry we cannot give you the information you ask for; but we have had no experience in the apparatus you mention.

J. L. D.—1. Your formula is not so good as the one we recommended; it would not be alkaline. Your fixing bath is far too dilute: use 1 part of hypo. to 4 of water. 2. Try the collodio-albumen process, given by Mr. Sidebotham in a previous number; and see a letter from the same gentleman recently inserted. We shall be pleased to see your results.

A MACCLESFIELD AMATEUR.—Your stop is much smaller than it need be; ½ inch aperture would be quite small enough with a lens 6 inch focus.

W. S. B.—The specimen of protosulphate of iron which you have forwarded, as being prepared according to the receipt given in our last number, is perfectly pure, and need not be recrystallised. Our correspondent states that the following are quantities which he used, according to the method there given:—iron filings, 8 ounces; sulphuric acid, 14 ounces; water, 4 pints.

S. E. LAW.—We are much obliged for your suggestions, and will give the matter serious attention.

JOHN.—We think so.

J. L. F.—Your print is very good; we would have noticed your picture in our review of the exhibition, but could not find your name in the catalogue. Will you favour us with the details of your quick process? We have heard of the collodion film cracking, after a lapse of some years, and attribute it to the varnish being inferior; but we do not think the cause of this annoyance is really known.

W. J.—Your lens would do for views if it were stopped down to about half an inch aperture, but we could not tell you the field it would cover without an examination.

A SUBSCRIBER.—1. Neither pyrogallic acid nor chloride of silver will take any harm by being kept in paper in the dark. Nitrate of silver, however, should be kept in a stoppered bottle. 2. The size of the diaphragm and its distance from the lens, will depend upon the size of the latter. 3. The "simplest way to ascertain when a bath is in proper working order" would be, in our opinion, to take a picture with it.

Δ.—We are much obliged for the report, and shall always be glad to receive similar information. The fault must be in the paper you employ; try some other make.

J. C.—The half plate portrait lens will answer better than the 3-inch single lens for the purpose of enlarging a small picture.

P. S.—1. We believe that collodio-albumen plates prepared as far as spreading the albumen, will keep for a considerable time in a dry place. 2. We like the process you have marked (ii.) best.

BENGALEE.—We decidedly think that the collodio-albumen process will be the best to carry on in India, both as regards facility in manipulation and fewest traps to carry. Perhaps some of our correspondents who may have had experience in working in a similar climate, will favour us with their experience.

FATHOM.—Leave out the nitric acid from the developing solution, and if that does not remedy it, fix it with hypo. instead of cyanide.

H. DOUBLEDAY.—Will you kindly favour us with a full description of the construction of and mode of using your substitute for a tent? as it will be of great use to many of our correspondents.

REUBEN.—Follow the process at p. 86.

DURHAM.—Thanks for your communication. Your concluding suggestion would, we fear, be impracticable at present, owing to the slow nature of ordinary photographic printing.

W. G. G.—If the answer to X. Y. Z. will not help you, we cannot assist you further without seeing your lenses.

T. L. H.—Articles on the subject are in preparation.

J. BERRY.—We will shortly give the best formula.

W. A. BAILY and VIGNETTE.—Received with thanks.

ERRATUM.—In our review of the Exhibition of the Photographic Society, last week, we erroneously spelt a gentleman's name Crittenden. It should have been Cruttenden.

Communications declined with thanks:—F. S. A.—Hypo.—Thompson.—A Printer of Stereograms.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "PHOTOGRAPHIC NEWS:"—John F.—A. B. T. (Dundee).—Zampa. (See our Notes and Queries.)—J. T.—S. Artridge.—H. B. Y.—Novice.—Caleb.—W. A. T. W.—C. A. P.—Monk.—Hypo.—A. B. C.—No. 6.—Verdant.—William.—A Subscriber.—A. A. B. B.

IN TYPE:—C. A. (Algeria).—A Subscriber.—H. E. N.—E. R.—W. Cochran.—Viator.—T. B.—H. S. L.—E. Pepper.—An Amateur.—E. H.—W. D.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. CROOKES, care of Messrs. Cassell, Petter, and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

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A NEW METHOD OF TONING WITH CHLORIDE OF GOLD.

BY M. LE GRAY.

[The following letter was addressed to M. Regnault, of the *Académie des Sciences*.]

I SHALL be obliged if you will have, at the next meeting of the Academy, a sealed packet opened, respecting the toning of paper photographic proofs, which was deposited by me on the 13th of January, 1858.

I beg you will at the same time rectify an erroneous statement which I believe I committed in that communication, and to submit to the judgment of the Academy the following improvements which I have introduced into my process.

The correction to be made is, instead of water salted at 50 per cent.,

Water strengthened with 50 per cent. of water salted to saturation	1000 parts.
Chloride of gold	6 „

The modifications I have made in my process consist in the substitution of chloride of lime of commerce (hypochlorite of lime) for the chloride of sodium, and in the more exact quantities pointed out by experience.

In considering this new mode of fixing, my object has been to produce the same effects that I pointed out some years since, in a memoir on fixing with the chloride of gold acidulated by hydrochloric acid, in evading the inconvenience of the reaction of the acid on the hyposulphite of soda.

I had succeeded in the substitution of the alkaline salt for the acid salt indicated in my preceding communication, but the object was not entirely attained; the chloride of sodium did not completely remove the yellow tint that positive paper often acquires, especially albumenised paper, which has been prepared for any length of time.

It behoved me, therefore, to push my researches further, and I believe that I have at last succeeded, by availing myself of the decoloring principle of the chloride of lime.

The formulæ and manipulations consist—

1. In freeing the proof, by washing for a few minutes in two waters, from the free nitrate of silver contained in the fibres of the paper.

2. In submitting the proof to the action of an auriferous bath thus composed:—

Distilled water	1000 parts
Chloride of lime of commerce in white powder (hypochlorite of lime)	8 „

Filter and add:—

Chloride of gold (dissolved in 100 grammes of distilled water)	1 „

The picture acquires in this bath a black tone which gradually tends towards a *blue*, at the same time that the yellow tint is restored to a brilliant white. It requires from ten minutes to a quarter of an hour to produce the maximum effect of this method of toning. Practice will be the best guide to the attainment of any particular tone. Nevertheless, as some guide in preliminary essays, I will observe that by leaving the proof for one minute in the bath, a violet-red tint will be obtained after fixing with hyposulphite, and a very clear blue-black tone after a sojourn there of an hour or two.

In this time the proof passes from violet, through all the intermediate tones, up to a deep black in the shadows, and afterwards from the black to blueish tones, becoming gradually weaker and weaker; of course, I mean after the final fixing in the hyposulphite of soda.

There are, therefore, two periods; the one ascending in the scale of intensity, the other descending.

3. To pass the proof anew in a bath of pure water, twice charged, to remove the chloride of lime. This washing may be performed very rapidly.

4. To afterwards fix the proof in a hypo. bath composed of one volume of hyposulphite of soda in crystals to six volumes of water.

This bath ought to be used for only a small number of proofs, the object of it being to remove the chloride of silver not acted upon by the light, which is contained in the fibres of the paper. The effect is produced in from ten to fifteen minutes, according to the temperature.

As soon as put into this bath the proof loses a little of the blue-black tone which it had acquired in the chloride of lime bath, and passes to more violet tints.

If the tones thus obtained are satisfactory, the ordinary washings in water may be at once proceeded with, and the proof dried; but, notwithstanding, I would advise, with a view to its perfect stability, to carry it through the whole series of operations.

5. To bring the proof to the final tone in a bath thus composed:—

Distilled water	1200 parts.
Hyposulphite of soda	200 „
Chloride of gold	2 „

The proof ought not to be left in this bath less than fifteen minutes, as that is the minimum time necessary to insure the permanency of the picture, but it may be allowed to remain in it for as much longer as is requisite for obtaining the desired tone.

6. To continue the washings in water in use in the old processes, especially recommending a washing in warm water to remove all trace of the salts.

I must observe that the proofs obtained by this process, beside the fine qualities of tone which they offer, have the advantage of not changing with time, a result I have verified on portraits which I fixed by this means more than eight months since . . . . . . The advantages of this new method of fixing, consist principally in this, that it avoids the decomposition of the hypo. bath by the exclusion of every trace of free nitrate of silver in the proof, and that it preserves a very harmonious black tone in the proof, communicated to it by the gold bath; a tone which is not destroyed by a lengthened sojourn in the hyposulphite of soda, the destructive property of which is well known.

I would also remark, that, in the old method of fixing with the bath of hyposulphite of soda and chloride of gold, the cause of the destruction of the pictures was the presence and formation of an acid occasioned by the use of this bath, which in time led to its decomposition. I have succeeded in restoring its original qualities to this bath by mixing carbonate of baryta with it, and then filtering. It resumes then the qualities of a new bath, and gives pictures of great permanency.

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.*

WHILE on the subject of "first appearances," we must not forget to congratulate Messrs. Delferier and Beer on their *debut* in the photographic world as composers. They, too, have attempted some Oriental scenes, and with very great success, because they have what we have just urged, viz., the natives of the countries, whose customs and manners they attempt to illustrate, for their models. The picture of "The Caravan in sight" is most effective and pleasing; and the expression of the man's face as he pulls the curtain of the tent on one side to catch the first glimpse of the approaching caravan, is well done. There is true feeling in the picture, and an absence of that stiffness of which we have complained in other compositions. Of "Medora" (77), we cannot say much, though there is great taste displayed in the arrangement, as there is also in the picture of "Arabs entertaining a Turk" (81). In this picture, as in Number 78, there is a real Turk and a real Arab, and this, added to the proper national dress, gives the picture a pleasing reality. The frame containing "Preparing for the Market," and the "Dead Bird" (73), is interesting as a specimen of good arrangement. The expression of the female in "Preparing for the Market" is perfect. She stands beside the half-packed hamper with her finger to her lip, as though she were puzzled what next to put into the hamper. The arrangement of the apartment is very perfect, and has this merit, that it is not—as many pictures of this class are—crowded. The "Dead Bird" is similar in composition; but as an *ideal* picture is far below the other one. The most successful compositions by these gentlemen, and, indeed, in the whole exhibition, are "Forty Winks," and "One Wink" (82). In the first we have an old fisherman in his cabin, surrounded by nets and lines, corks and all the other necessary fishing tackle, arranged in a most natural and effective manner. The old gentleman, evidently overcome with his day's labour, is quietly dosing, his head resting on his hand. The sleepy expression of the old fellow is worthy of Collins, who is so successful in his studies of fishermen. The sleeper evidently enjoys his "Forty Winks." In "One Wink," however, we have the same old piscator, rather more lively and sprightly. He has in hand a huge square-shouldered stone bottle, from which he has just replenished a large goblet; and, judging from the very humorous, sly, and knowing "wink" which he casts at the spectator over his shoulder, we may safely arrive at the conclusion that the liquid which he has taken from the stone bottle is something stronger than that which teetotallers generally imbibe. The expression displayed in these pictures, in the broad humour of the characters, and the clever tact with which everything is put in its proper place, at once bespeak for these gentlemen an artistic knowledge of no mean order. They are entirely free from that vulgarity which we have spoken of in other compositions. The pictures by these gentlemen may be considered legitimate, and among the best specimens of the compositive art.

When we noticed Mr. Morgan's landscapes in our last number, we purposely omitted reference to his two pictures of the "Wheat Field" (102 and 114), because we thought that they belonged more properly to the compositive. We have often heard it urged against Linnell, jun., that he was too minute in his rendering of landscape pictures, and that, while not an ultra pre-Raphaelite, he bordered too nearly on that style. But to those objectors we would recommend the study of these two beautiful subjects by Morgan. The sheaves are taken in the most natural positions; and we think that no greater compliment could be paid to the artist than the remark we heard a lady make, "Oh, that's a copy of a picture which was at the Academy last year."

We must conclude these remarks on composition, by naming a large picture which has been taken by F. Elliot, of his stereoscopic slide, "The Inventory" (500), of which we have already spoken, as also of "Homeless and Houseless" (566). We know not whether the composer of this picture has entitled this reproduction "Homeless and Houseless" on account of the great interest which is being taken in that unfortunate class, through the powerful influence of the press. We are sure of this, that if it is so, the artist has sadly failed to give us an ideal representation of what the writer has so powerfully depicted. The "Homeless and Houseless" is too prettily romantic, and the background views are too picturesque; while the pretty face of the "Homeless" has too contented a look to excite pity, or in any respect to correspond with what we have read of in St. Giles's and Rose Alley.

And now we come to a subject on which we have been very frequently attacked, because exception has been taken by some to what we have said on it; we need hardly say we allude to "questionable subjects." We are astonished to find that the hanging committee have admitted a stereoscopic piece of a kind which has from time to time been condemned. We are glad that, among the leading notices which have appeared of the exhibition, what we have said on other occasions has been reiterated by most of the leading journals. Speaking of the present exhibition, the *Times* says that, "when the stereoscopes are not landscapes or portraits, the slides are '*snobbish*' to a painful degree." Another contemporary says, "One other set we notice for the sake of a protest against their presence here. Stereographs of 'fast' young men, looking from a hiding-place in the cliffs at girls preparing to bathe in the sea, or 'ladies' in full dress, leaning over a balcony, their development exaggerated by a well-known stereoscopic trick, are not what ought to be found in a place like this; and those have neither novelty nor superior executive skill to atone for their intense vulgarity of sentiment. The Council will do well to ask themselves whether it be even now too late to remove what has called forth a general expression of disapproval and surprise." Another contemporary says—"Mr. W. H. Bosley's frame lends a countenance to the abuse of the art to be seen in some of the shop windows, which it ought not to find on those walls." We think that our readers will see that there is a pretty general and widespread feeling against this class of pictures, and will tend to prove that what we have from time to time said on the subject has not been uncalled for.

In portraiture the collection is peculiarly rich, though, perhaps, not interesting. On this subject, we cannot do better than extract some very able remarks from our able contemporary, the *Literary Gazette*:—"Portraits elaborately 'touched,' and often highly coloured, of nameless individuals of both sexes, are as numerous and as prominent as at our Exhibition of the Royal Academy; and, if possible, their presence makes itself even more disagreeably felt here than there. At the Academy they are for the most part 'above the line,' and you can escape the infliction by not looking so high. Here, right on the line, you see not merely frame after frame, having in the catalogue against the numbers simply the word 'portrait,' but an almost interminable succession of 'frames of portraits,' each containing half-a-dozen, or a score, as the case may be, of nameless and meaningless faces, like the cases you see hanging outside the shop doors in Regent-street or the Strand. Ordinary photographic portraits of persons of whom you know nothing and about whom you care less, are, probably, of all the wearisome things with which this world is encumbered, the most entirely and irredeemably wearisome."

T. R. Williams is, of course, the first in *untouched* photography, and beautifully does he produce those exquisitely fine vignettes, which are so charming and attractive as specimens of pure photography. A Russian, of the name of Chlaponin, has sent some very interesting studies and portraits; the peculiarities in his pictures are, the intensity of the black tone, combined with great softness and half tint. His picture "The Queen of Spades" (352), is really a

* Concluded from p. 242.

charming thing, and should be ranked among the curiosities of the collection.

There are many coloured photographs in the exhibition, the leading contributors being Lock and Whitfield, who have some elaborately finished miniatures, but which are by no means so artistic as "portrait" (402), by Henry; the softness and beauty of this picture are remarkable, while there is a considerable degree of vivacity given to the expression. The portrait of Her Royal Highness the Princess Mary of Cambridge, by one of Caldesi and Montecchi's artists, is very good as a specimen of the application of photography to high art. Whatever miniature painters may say, even though they quote "very high personages in the realm," who lay down the rule that "photography is better than bad art," there can be no doubt whatever but that the miniature painter's "vocation," like that of Othello, "is gone;" for it stands to reason that, if people in these days of rapidity and competition can get a portrait as artistic and as highly finished as ever was produced by the old miniature painters, and for a quarter of the money, they will be sure to avail themselves of the privilege. It must be borne in mind that all miniature painters are not good draughtsmen, and if they paint over photographs, what they lack in drawing is supplied by photography. By the old system of miniature painting, about a score of "sittings" were necessary, and then the likeness often failed; while now, by means of photography, only one sitting of half an hour is necessary, in order to produce the most elaborate and highly finished miniature. To the effect of photography on miniature painting, we may again revert at greater length.

As interesting mementos, Dr. Diamond's frame entitled "Recollections of Our Club," will attract a great deal of attention. The portraits of Dr. Percy, Douglas Jerrold, Charles Knight, Hepworth Dixon, Shirley Brooks, and others, are among them. In conclusion we may just state, that we are at all times glad to hear of the application of photography to any department of science, but we question the taste of exhibiting all the results. We, therefore, are averse to exhibition of such pictures as the "Illustrations of Mental Disease" (597). These photographs ought to adorn the walls of the physician's study, but certainly not the walls of a public exhibition. They are neither interesting as works of art nor as photographs; it is well to know of the application, but we say again we do not want to see all the results. The photographs are perfectly hideous. We must not omit to mention a very pretty view at Harlesden, by Mr. Burke; nor the beautiful copies of pictures which Mr. William Johnson has taken of some pictures in Her Majesty's collection. The pictures which this gentleman has copied are most difficult subjects for photography, owing to the fact that many of them have a yellowish tint caused by accumulated varnishes; but, by clever manipulation, Mr. Johnson has succeeded admirably in obtaining clear definition. It would also be ungallant not to mention the nice little instantaneous pictures by Mrs. Down (289, 290). They are well taken, and in a manner that would do credit to many of our gentlemen photographers.

GENERAL OBSERVATIONS ON PHOTOGRAPHIC POSITIVE PROOFS.*

BY MM. DAVANNE AND A. GIRARD.

ON SENSITISING—(*continued*).

Of the Condition of Neutrality of the Bath.—The nitrate of silver baths employed in photography may assume from the point of view of their neutrality three different conditions:—neutral, acid, or alkaline by ammonia. As to the other alkaline bases, they can only restore the bath to a perfect neutrality, without being able, on account of the precipitation of oxide of silver, to communicate to it an alkalinity appreciable in its effects on positive proofs.

If we take as a type a proof prepared on a perfectly neutral nitrate bath, and compare it with another prepared on the same bath, to which we have added 1 per cent. of nitric acid, that is to say, a great excess, we recognise an important difference; the second is redder, the lights are better preserved, while in the first the tone is blacker, and the whites seem to have a greater tendency to darken.

This result agrees with those we have already observed in using acid, neutral or alkaline chlorides; the explanation is the same in both cases, and is based on the influence exercised by the acid liquors on the sizing, which it thus renders more adapted to combination, and, by consequence, to the production of red tones.

The ammoniacal nitrate of silver bath ought to be the object of an especial study on our part. It ought to be prepared in such a way as to contain only just the quantity of ammonia necessary to re-dissolve the oxide of silver which this alkali at first precipitated (it will be seen that this point has been reached, when a drop of soluble chloride added to the liquid yields a precipitate which does not re-dissolve). If, indeed, a great excess of ammonia be added, the bath will dissolve the chloride of silver, in proportion as it is formed on the sheet of paper on its contact with the chloride of sodium, and this, not being clothed, except with a very feeble quantity of argentiferous compound, will only yield a grey and valueless picture.

Prepared under favourable conditions, the ammoniacal bath furnishes the following results on a paper that one places on the surface for two or three seconds only, in order to avoid the washing away of the size. The proof, compared with that prepared on a neutral bath, develops itself in nearly the same time; the tones remain black, but without presenting any superiority over those obtained by ordinary processes.

It is, besides, easy to verify the influence of ammonia in excess. If a sheet of paper be passed in an ammoniacal bath, leaving it there only some seconds, it furnishes a proof such as we have defined; but if the contact be prolonged so as to allow the ammonia to act on the starch to swell it, the result is quite different, and the whole appears tinted a pale red, at the same time that the design loses all vigour and clearness.

Thus the action of an acid or ammoniacal bath may be precisely stated, but nevertheless, in some particular cases, of which the photographer will be the judge, it appears advisable to use nitrate of silver baths that are sensibly neutral.

The nitrate of silver, such as it is found in commerce, presents itself under three conditions—crystallised, white fused, or grey fused, that is to say, up to the commencement of reduction. We have made some experiments with the object of establishing—if certain differences in the result are due to the employment of one or the other of these. We have not observed any salient difference, especially between the two latter; the bath prepared with the crystallised nitrate gave rather redder tones, a result that is easily explained by our preceding observations, since the crystalline nitrate of silver always contains traces of nitric acid: and, consequently, we return to the point from which we set out, *viz.*, the neutrality of the bath.

But this difference is so trifling, that nitrate of silver crystallised from water, and not from nitric acid, may be advantageously employed in positive photography.

Of the Introduction of Foreign Salts in the Nitrate of Silver Bath.—The foreign salts that photographic manipulations may introduce into the silver bath are of two kinds:—the one arises from the double decomposition which takes place between the chloride with which the paper is impregnated, and the silver bath on which it is floated; the second, with the pulp of the paper or the size which covers it.

1. The formation of chloride of silver in the pulp itself of the paper on contact with the nitrate of silver bath, necessarily involves the equivalent production of a nitrate, the base of which is the chloride employed in salting the paper. Thus, when a sheet of paper impregnated with common salt is placed on the silver bath, it gives rise to the

* Continued from page 244.

formation of a nitrate of soda; if the salt of ammonia be employed instead of the common salt, then nitrate of ammonia is formed. It was of interest to examine, in the first place, if the nitrates thus formed remained on the sheet of paper which retained them by capillary attraction, or if they were dissolved in the silver bath; and in the one as in the other case, it was important to establish the influence exercised by these bodies on the *venue* of the picture.

Experiment has proved to us that the major part of these nitrates remained on the sheet of paper, for in taking a bath which, frequently strengthened with nitrate of silver, had served to prepare a very large number of proofs, and submitting it to analysis, we found in it after removing the silver but 1 per cent. (or thereabouts) of foreign salts. The proportion ought to have been much more considerable, if, in the numerous operations for which it had served, the major part of the alkaline nitrates had not remained on the paper. For the rest, the later proofs prepared on this bath, which, by successive additions of nitrate, had been maintained at a constant strength, in no way differed from the first.

We considered it advisable, however, to ascertain if, in increasing the quantity of these nitrates, the proof might not be influenced, and we found, in forming these proportions, by adding up to 10 per cent. of nitrates of ammonia and soda, these being crystallised or fused, striking differences in the proofs were obtained; the presence of this large quantity of nitrates rendered the proofs less vigorous, and caused them to assume a lighter tint. The effect is especially marked with fused nitrate of soda, a result it is easy to account for from the alkalinity which this salt possesses after its fusion.

In fine, as it appears impossible that under ordinary circumstances of photography a nitrate of silver bath can change itself to this extent with nitrate, a silver bath may be always strengthened, without any fear that the proportion of foreign nitrates which it may acquire can alter the value of the proofs.

2. The salts which the pulp of the paper itself may contain, are too insignificant in quantity for one to suppose them capable of exercising any appreciable action by their dissolution in the bath; but it was of importance to examine if the alum contained in the gelatines employed in sizing was equally innocuous.

Experiment has shown us that this is really the case, and that whether by impregnating the paper, or by adding a certain quantity of this salt to the bath, no difference manifested itself between the proofs prepared under these conditions and those prepared under ordinary circumstances.

(*To be continued.*)

PHOTOGRAPHY IN ALGERIA.

NO. IV. (*continued.*)

I MUST say that the tale gave me but a very small part of the satisfaction which the natives seemed to derive from listening to it, from which I conclude that the translation was inferior to the original; in fact, I am certain that they are in the habit of seasoning their tales with a kind of salt which is not attic, and which Hamed, out of regard for what he considers my religious prejudices, invariably omits. Some desultory conversation followed, turning chiefly on successful thieving exploits, which one of them delicately termed "a pious fulfilling of the will of Allah;" indeed, stealing from the members of another tribe is regarded as a moral virtue, and a thief exults in his success in proportion to the difficulties he encounters and overcomes in the operation: in short, in such matters, they appear to think that—

> "The simple rule, the good old plan,
> That he should take who has the power,
> And he should keep who can,"

is *the* rule to guide their conduct. I do not know whether my property would have been safe from the predatory assaults of the inhabitants of the douar if I had left it unprotected, but I had no intention of running the risk; besides, it was infinitely preferable to sleep in the wagon, to shutting myself up with a family party, which included the dogs: and Hamed was of the same opinion, for he asked my permission to sleep on his property, which I was not the least unwilling to consent to. We sat chatting for some time after the others had gone to rest, and after awhile we too partly undressed ourselves, and, except the incessant barking of the dogs, the most profound silence reigned, which was suddenly broken by a shrill scream, followed by a succession of others. I was a good deal frightened (it always frightens me to hear a woman scream, and breaks my heart to see her cry), and I gave Hamed a shake, and then ran in to see the cause. I found that the screaming proceeded from the women's apartment, but I knew better than to enter there, and was, therefore, obliged to remain in suspense until Hamed came, for the men, who were lying about in the outer department, went on with their sleeping as if they were angels' whispers which came so shrilly through the canvas partition. In a minute or two Hamed walked in, and, after listening a little, said, it was only——— administering a "*petite correction*" to one of his wives. I thought the word "*petite*" scarcely indicated the amount of correction, for, judging by the sound, the fellow was "laying on" like a score of Macduffs, and with a disregard of public opinion which was in striking contrast to the delicate susceptibility of the Greek at Constantinople on that point, who, as I read in the *Akhbar* the other day, whenever he had occasion to beat his wife, which was rather frequently, used to fetch an organ-grinder from the street into his room, in order that his neighbours might not have their feelings hurt by hearing her cries. Finding that it really was only the man beating his wife, I did not remain to hear the conclusion.

This method of keeping women in order does not appear to be unusual here; in fact, the Arabs are, in a good many respects, a primitive kind of people, and resort to first principles in this, as well as in many other things.

Our entertainer was extremely anxious that we should remain with him some days; but, as there was nothing in the neighbourhood of sufficient interest to yield me pictures, I refused. I took a portrait of him, and you will be surprised to see how grave and patriarchal a man may look in spite of his indulgence in the amiable weakness referred to above. I had a good deal of difficulty in inducing him to sit, and I am sorry to find that this reluctance is common among the natives now that I have left Algiers, and I am afraid that I shall be unable to get photographs of women anywhere except in garrison towns. Hitherto, Hamed has alleged that his women will not consent to sit, but I have hopes in that quarter still.

I expect to be more successful, in bringing home a larger number of good negatives than any photographer who has yet visited Algeria, inasmuch as I am able to employ the wet collodion process almost invariably. I have made my vehicle perfectly dark, and though it has not the convenience of being lighted by means of yellow glass windows, I get along very well with the light of a lamp. The extreme rapidity of the process is a special advantage where it is interesting to get a group of half savage natives, who would either refuse to sit if they were asked, or, if they did, would want to be paid for it; whereas now, if I see a group round a well—and where there is a well there is almost a certainty of there being a lot of natives about it—the driver stops in the position he is directed, and goes off to get some water for the cattle. In this way I have already taken several pictures, without the natives being in the least conscious of it, and you will see that this in itself is no slight advantage to the appearance of the picture. The exposure requisite is very short; the clearness and brilliancy of the atmosphere being so superior to what you enjoy in England, and the power of the actinic rays being proportionately greater.

There is one thing which I would strongly advise any of your readers who may come out here not to neglect, and that is, a box for carrying the plates which shall secure them from every possible injury. I cannot conceive that there

would be any difficulty in constructing such a box; at all events, I should think the gentleman who has given you the advantages of his experience as a travelling photographer, might design one which would answer the purpose. I have already met with one or two unpleasant accidents in consequence of the boxes containing my plates having been knocked about rather violently, and I am afraid that when I make excursions among the mountains I may suffer still more severely; and only imagine the annoyance, after working for days under such privations in regard to food as nothing but a sincere love of the art could induce one to submit to, of having the result of one's labour destroyed in an instant by the animal carrying them making a false step. I have tried the only means in my power of guarding against this, by making a couple of wooden boxes, with partitions just sufficiently wide apart to allow of the plate sliding down, the back of it being held in close contact with the wood; but I fear that in the event of a tumble this would not prevent some of them from being fractured by the concussion.

I have got one negative which I guard with special care, for on it hangs a tale. I was going to say, it is almost too good to be true, but perhaps that would sound unfeeling; what I mean is, that it seems too singular. The picture is that of a dilapidated-looking building, of rather a large size for this country, standing beside a road; the wood comes down almost close to it, and between it and the building there is a well. The appearance of this building induced me to ask Hamed what it was used for, when he told me that it had formerly been inhabited by a religious body of Mahomedans, to the number of fifty. These devotees, if I may so term them, had the cub of a lion given to them, which they brought up as if it were a dog, and which, though perfectly tame, they kept fastened up by a chain in the courtyard. One day the spirit of his race awoke in him, and he burst his chains and disappeared. They would not have cared much for this if his disappearance had not been followed by the disappearance of sundry members of the flocks and herds of the surrounding douars, and even this they might have resigned themselves to in time, if time had been given them. One evening the chief of the monastery went out to the well to perform his ablutions, it being the custom for him to perform his ablutions alone; but when a more than reasonable time had elapsed for the purpose, and he did not return, he was sought for, but like the young woman whose lamentable fate is recorded in "The Mistletoe Bough," he was not to be found. They resigned themselves to the loss, and another succeeded to his functions, and, sad to relate, the next evening he, too, disappeared under similarly mysterious circumstances; not a trace of him could be discovered: and, to cut a long story short, Hamed said this continued until there were only eleven left, and they, notwithstanding their convictions as to the impossibility of avoiding the decrees of destiny, and the sinfulness of attempting to do so, emigrated in a body to a distant institution, and thus escaped the fate of their brethren, whose disappearance was accounted for in this wise:—The lion had eaten them all; each evening he had seized the first who came out, and carried him off into the wood, probably he knocked him down in the first instance and stunned him, and then took him off to devour at his leisure. Whether this tale is altogether true, is more than I will venture to say, notwithstanding all Hamed's assurances that it is; but I have no doubt there is some foundation for it.

I hope to be able to send you some pictures shortly, for in order to obviate in part the risk of accidents, I have been printing some copies from each of my negatives since I have been here. C. A.

THE ARCHITECTURAL VIEW LENS.

As a mark of his "friendly feeling towards the Photographic Society,"—for which the Society ought to be very grateful —a Mr. Sutton has sent a communication respecting a lens which he terms the "Architectural View Lens." It is composed of two equal and similar achromatic meniscus lenses, placed with their concave sides towards each other, and between them, at equal distances from either, a small concave lens with surfaces of equal radii, with a stop in contact with it. For this combination he claims the merit of being free from distortion; and, in taking pictures of buildings, that it does not incline the vertical line either right or left, while it represents objects in correct perspective; also, that every part of the picture is equally illuminated; that the angular extent of field is only limited by the sharpness of the marginal definition; consequently, by the size of the stop, the chemical and visual foci strictly coinciding. He admits that this combination, being always used with a small stop, is a slow instrument.

It will be seen, from his own showing, that it is only specially adapted for one department of photography, viz., architectural; and we are disposed to think that it may very well be applied to this department, inasmuch as it really is, in all probability, capable of giving pictures of buildings free from distortion; but this is about its only advantage, and is an advantage which it has in common with the patent aplanatic lens, in which the distortion is inappreciable in amount, while it is in every other respect superior.

The disadvantages of this new lens are, its costliness, its great bulk, and its extreme slowness; three drawbacks which will effectually prevent its competing with the best lenses manufactured already.

CASEINE FOR PHOTOGRAPHIC PURPOSES.

BY C. A. SEELEY, ESQ.

An American contemporary contains the following remarks on the paper by M. Duchochois, on "Caseine," given at p. 183 of the "PHOTOGRAPHIC NEWS":—

"We have repeated some of the experiments of M. Duchochois on caseine, and readily agree with him, that it will prove a valuable material for our purposes. The chief obstacles in the way of its successful use seem to be, the difficulty of preparing it of sufficient purity, and the apparent impossibility of preserving it without change. The pure solution coagulates almost as rapidly as it can be filtered; by the addition of ammonia, however, it may be kept indefinitely. Whether the ammonia has any injurious effect, we are unable to say. Of course, metallic iodides cannot be used as excitants.

"A very speedy method of preparing the ammoniacal solution is, to carefully wash the curd precipitated in sour skimmed milk, and dissolve in water to which a small quantity of ammonia has been added; by filtration, or allowing it to rest, the solution becomes quite clear, and fit for use. A small quantity of lactate of ammonia is the chief impurity. The ordinary method of purifying caseine leaves it insoluble. Besides the uses suggested by M. Duchochois, we have found that caseine makes a good varnish for positives on paper. Will it turn yellow?"

CARBON PRINTING.

WE extract the following from *Cosmos*:—

"Mr. Pouncey, who has caused so much talk during the last half-year, read, at the last meeting of the London Photographic Society, the description of his method of printing positives with carbon; and our readers will be greatly surprised to see that it scarcely differs from M. Testud de Beauregard's process, and that of MM. Salmon and Garnier." (Here follows a description of the process, as given in the "PHOTOGRAPHIC NEWS," p. 213.) "The first positives obtained by Mr. Pouncey left much to be desired, both in respect to half-tones and aerial perspective; his last attempts are much better; but still it cannot yet be said that the carbon reproductions can compete with the positives obtained with the salts of silver."

Lessons on Colouring Photographs.

THE RELATIONS AND HARMONY OF COLOURS.

Before proceeding to the manipulatory details of other modes of using colours, it is important to know something of their relations and contrasts, and of the principles on which harmony is based. This knowledge is a first requisite to the colorist, for, whilst a good eye will sometimes enable him instinctively to produce good results, yet, without some familiarity with the laws which govern harmonious colouring, anything like entire or uniform success cannot be hoped for. Even to imitate the colours of the original satisfactorily, this knowledge is desirable; whilst to produce a picture which shall please and soothe the eye by its judicious arrangement and combination of colour, it is absolutely necessary. The most perfect mechanical skill is comparatively useless without this knowledge, for whilst in colouring portraiture the colorist must imitate as closely as possible the inherent or natural colours of the original, yet as the choice of accessory colours, in draperies and background, &c., depends largely on his taste and judgment, on the judicious management of these he must rely for those contrasts which shall give full value to the inherent colours, and secure at the same time harmony and keeping in the whole.

There are only three simple or primary colours, that is, colours which cannot be produced by compounding other colours, and by the combination of these three, every other possible hue is attainable. These colours are *yellow*, *red*, and *blue*. The source of all colours being solar light, the seven tints of the solar spectrum,—produced by dividing a beam of white light by means of a prism,—were at one time regarded each as elemental colours; very little observation, however, will show that these three only are simple or elemental, the others being produced by the mixture of these three.

By the combination in proper proportions of any two primaries, a *secondary* colour is formed. Thus yellow and red produce *orange;* yellow and blue produce *green;* red and blue produce *purple*. The three primaries and the three secondaries produced by their combination, are regarded as the only six pure or *positive* colours, all subsequent combinations tending to produce neutrality.

The combination of two secondary colours in due proportions produces a *tertiary*. Thus, orange and green produce *citrine;* purple and green produce *olive;* and purple and orange produce *russet*. These have been classed by some amongst the positive colours; but are more usually regarded as the first gradations towards neutrality, and are styled semi-neutrals. These combinations may of course be continued further, without losing precision in nomenclature, although each admixture produces a less definite tint.

The secondary colour formed by any two primaries is what is called *complementary* to the remaining primary; that is, it completes the balance of colour on which harmony depends. Thus the mixture of yellow and red produces orange, which is complementary to the remaining primary, blue. The mixture of yellow and blue gives green, which is complementary to the remaining primary, red. From the mixture of red and blue we obtain purple, which is complementary to the remaining primary, yellow. In like manner, the tertiary formed by the mixture of any two secondaries, is complementary to the remaining secondary. Thus, the combination of orange and green gives, as we have said, citrine, which is complementary to purple. By the mixture of purple and green we obtain olive, which is complementary to orange. The result of a combination of orange and purple is russet, and this is complementary to green. The same principle will apply to every variety of hue produced by combination; for instance, scarlet is red with a very slight admixture of yellow or orange; the complementary green will therefore possess a similar slight admixture of blue, the complementary of orange. Crimson, on the other hand, is red, with a very slight admixture of blue, and the complementary green will in that case incline a little to yellow; and thus in almost infinite gradation.

The combinations of which we have been speaking, it must be observed, are of colour with colour, and the result is in all cases another *hue*, which term applies simply to colour and not to intensity. A *tint* of any hue is obtained by diluting it with white; and a *shade* of any hue by the addition of black. The various gradations of intensity of any hue are termed a *scale*.

White and black are not regarded as colours. Theoretically, white being most nearly allied to light, is supposed to be a combination of all colours; and black as most allied to darkness, is supposed to be a negation, or absence of all colour. Practically, however, the pigments of the painter but very imperfectly represent the pure colours of the solar spectrum, and the compounding of the three elemental colours, each neutralising the other, produces what is termed a normal grey, or a very near approach to black. White and black, therefore, practically constitute the extremes of the neutral colours, and greys their intermediates.

(*To be continued.*)

Photographic Chemistry.

CHEMICAL MANIPULATIONS—(*continued*).

Weighing.—The operation of weighing is simple enough, consisting merely in placing the body to be weighed in one scale, and a suitable weight in the other. In ordinary photographic operations the same nicety in weighing is not required as in chemical researches, where it is necessary to weigh to the thousandth part of a grain. The most useful scales will be a pair such as is used in goldsmiths' shops, which can be taken down and placed in a box, where they occupy little space, and are thus easily transported. The substances to be weighed should never be placed on the scale-pan, but on a piece of paper, a corresponding piece being placed in the opposing scale. In the case of substances, in the weighing of which extreme accuracy is not required, and which are used in rather large quantities, a measure may be substituted for the scale, and thus some trouble may be saved.

Liquids should, as far as possible, be measured in graduated glasses, and resort be only had to weighing them in cases of necessity. These glasses can be bought at any glass-vendor's, and it is far better to buy them than to adopt any of the methods suggested for making them.

The utmost precaution should be taken to keep all the utensils used in the laboratory perfectly clean; and it is therefore advisable to wash all glasses immediately after using them, and to wipe them carefully, not only with linen cloths, but afterwards with blotting-paper, or tissue-paper. If the dregs of the solutions left in them be suffered to dry, there will be considerable difficulty in cleaning them.

Apparatus.—The operator will often find it necessary to use corks with holes drilled through them, in which straight or bent tubes may be fixed. The manner in which these holes are made is by means of a round file. The hole is first made half-way through the cork, which is then turned and the remaining half pierced from the other side, care being taken that they meet exactly in the centre. Some practice will be required before this operation will be accomplished properly. When it is requisite to reduce the size of the cork, it will be better to use a file than a knife, as there is less danger of rendering the surface uneven.

Great care must be observed in fitting in the tube, as pressure in the wrong direction, even if slight, will be almost certain to break the tube, and may possibly very much hurt the operator. To obviate risk from this cause, the hand should grasp the tube close to the cork and insinuate it gradually and on no account violently.

A long glass tube may be easily divided into several of different lengths, by simply filing round the tube at any

given spot, and then breaking it off with the hands. To prevent the ragged end from tearing the cork, it is advisable to heat it in the flame of the spirit lamp until the glass is softened. By the same means any desired curvature may be given to the tube.

Analytical Manipulations are those which are employed to ascertain the nature or purity of substances. They are very delicate, and require great care in performing them. The articles required for use in these operations are by no means expensive, a few test tubes, common watch glasses, a thin plate of platinum, two or three glass rods, a dozen or so of stoppered bottles to hold solutions, such as nitric acid, nitrates of silver, of barytes and ammonia, which are employed as reagents in detecting the impurity of substances, a porcelain capsule, and a spirit lamp. These articles are employed in the following manner:—the watch glasses for receiving the solution it is intended to examine, to which is added, by means of a glass rod, two or three drops of the reagent intended to test its purity. The test tubes are to be used when it is necessary to boil the solutions, and the porcelain capsule when it is desired to evaporate them to dryness. The platinum is used in analyses of substances that volatilise without leaving a residuum, and should, therefore, be kept perfectly clean.

Distilled water must always be used in analytical investigations.

(*To be continued.*)

Dictionary of Photography.

ASTRO-PHOTOGRAPHY.—One of the most important and interesting applications of photography is, the delineation of the various celestial bodies, and the recording various astronomical phenomena which are frequently occurring. Photography has already been of great assistance to various departments of astronomy, and the following extract from a letter from the celebrated American astronomer, Mr. W. C. Bond, will be read with interest by our readers, as it gives an account of one of the most recent services which photography has performed for the practical astronomer.

"The near approach of the star *Spica Virginis* to the moon presented a favourable opportunity for testing the practicability of obtaining photographic impressions of a star when in close proximity to the moon, it being a question which has hitherto never been decided, whether the diffused light in the immediate vicinity of the moon would not overpower the actinic effect of the star. Preparations were accordingly made at the observatory of Haward College, for the purpose of deciding this point; and as Messrs. Whippole and Black, the eminent daguerrotypists, to whom we have on former occasions been so much indebted, volunteered their services, a large number of photographic pictures of the moon, and the star in its neighbourhood, were obtained before and after the eclipse: even at the emersion, when the star was in apparent contact with the bright limb of the moon, its image was distinctly formed. The experiment was perfectly successful; pictures of the lunar mountains were impressed on the glass plates by the collodion process simultaneously with that of the star, with minuteness and precision, serving as admirable points from which to measure the distance and position of the star. It is a curious fact worth noticing, that in every instance the impression of the star was, if anything, *too strong*,—the very reverse of which had been anticipated. The possible minimum time of exposure of the plate requisite for obtaining a visible impression of the object upon it could not at that time be ascertained. This is a favourable indication, as the shorter the time required the more accurate will be the result."

ATMOSPHERE.—The whole mass of aeriform fluid surrounding the earth. Photogenic effect is materially dependent upon the state of the atmosphere; and, as it is differently acted upon by natural causes, the variations of this effect are of daily occurrence. These effects are caused by the difference in the density, humidity, and colour of the atmosphere; and perfect photogenic success can only be attained when it is quite clear and free from haze, fog, or a yellow or reddish appearance.

ATOMIC THEORY in chemistry, or the doctrine of *definite proportions*, teaches that all chemical combinations take place between the supposed ultimate particles or *atoms* of bodies; and that these unite, either one atom with one atom, or by *sums* of atoms, which are integral multiples of unity.

AUROTYPE.—A process of taking photographs upon paper by the agency of gold, the discovery, we think, of Mr. R. Hunt. The process is not of much importance practically. The paper is washed with a solution of chloride of gold and potassium dried, and then washed with a solution of nitrate of silver, and again dried. This paper darkens with rapidity in the sunshine, and fair photographs are the result. The pictures are fixed with hyposulphite of soda. Other preparations of gold produce equally good results.

AXIS.—The straight line, real or imaginary, passing through a body, on which it revolves, or may revolve. An *axis*, in geometry, is that line in a plane figure about which it revolves, to produce a solid. The *optic axis* is a particular ray of light from any object which falls perpendicularly upon the eye.

AZOTE.—The old name for the gaseous element, nitrogen. It is not now used in England, but is still met with in continental works on chemistry; where, also, its derivations *azotic* acid and *azotate* are used instead of *nitric* acid and *nitrate*.

(*To be continued.*)

A Catechism of Photography.

DRY COLLODION.

Q. Can collodion be used *dry* for photographic purposes?

A. Yes. Dry collodion is employed by photographers with much success.

Q. Is its use desirable?

A. It is, on the ground that collodion plates so prepared may be kept for a long time without their sensitiveness being destroyed.

Q. How is this accomplished?

A. By an albumenised mixture of collodion; which, uniting the properties of the two substances—the rapidity of the collodion with the sharpness of the albumen—gives a dry coating capable of retaining its vitality unimpaired for a very considerable period.

Q. Who was the inventor of this process?

A. M. Taupenot.

Q. Is the process successful?

A. It is, as it is easy of manipulation, and gives results of the most exquisite beauty and minutiæ.

Q. How may the process be divided?

A. Into eight distinct parts. These are—

1. Cleaning the glass plate.
2. The preparation and application of the collodion.
3. The preparation and application of the albumen.
4. The application of the sensitive coating.
5. The development of the image.
6. Fixing the image.
7. Varnishing the plate.
8. The preservation of the glass so prepared.

CLEANING THE PLATE.

Q. What method is adopted in cleaning the plate?

A. In order to have the glass perfectly clean, the plates must be soaked for some hours in the following solution:—

Common potash	1 part.
Water	15 parts.

The coating of dirt, when the glasses are taken out of the solution, may be removed with a palette knife; after which the plates should be thoroughly rinsed in clear water.

Q. Will the same solution serve more than once?

A. Yes; many times. When the plates are removed from

it—washed, and partially dried—they are ready for the ordinary process of cleaning adopted in collodion manipulation.

Q. How many plates may be cleaned at one time?

A. Certainly not more than a dozen.

Q. Describe the process of cleaning the plates.

A. Place the glass upon a piece of white paper, the side which you intend to make sensitive underneath. Take three pellets of cotton wool; with the first cover your glass with tripoli, thus:—

Tripoli	16 grains.
Water	1 ounce.
Nitric acid	15 drops.

Rub this over the surface of the plate for some seconds; with a second pellet carefully remove the coating of tripoli; with the third finish the drying of the glass. It is necessary that this should be done before the tripoli has time to dry upon the surface of the plate. Having made one side of the glass thoroughly clean, you reverse it on a clean piece of paper, and proceed in a similar way with the other side, completing the polish by the use of a silk handkerchief. The process requires some care, and practice only can give that facility of manipulation which is possessed by experienced photographers. A chamois leather may be substituted for the handkerchief—some operators considering it better than silk.

COLLODION.

Q. What sort of collodion should be used in this process?

A. It is necessary that the collodion should be of a good yielding nature, and very adhesive to the glass. The following is an excellent recipe:—

Ether (60 degrees above proof)	400 parts.
Spirits of wine (40 above proof) ...	100 parts.
Gun cotton	4 parts.
Iodide of ammonium	4 parts.
Bromide of ammonium	1 part.

Q. As the collodion contains so much ether, does it not very rapidly evaporate?

A. It does; and on this account the glass should be covered with it as quickly as possible, so as to have a fine even coating. The best way is to pour the collodion on the middle of the plate, and work it round by turning the plate from side to side; the superfluous quantity may be returned to the bottle.

Q. When the plate is thus coated with the collodion film, what is the next process?

A. When the ether has evaporated, and the surface of the collodion is set, the plate must be dipped into the nitrate bath. This bath is formed of—

Nitrate of silver	7 parts.
Distilled water	100 parts.

The plate may be left in the bath about five minutes; it must then be removed; the excess of solution drained off; and the plate placed in a dish of water; filtered with extreme care. After being washed in this dish, it may be removed to another in a similar manner; then thoroughly rinsed under a filtering fountain; and, being placed at an angle on some good blotting paper, allowed to remain there for about a minute.

ALBUMEN.

Q. How is the albumen prepared for this process?

A. In a graduated glass, place a certain quantity of white of eggs, in proportion to the amount of albumen you intend to make. For instance:—

White of egg	2 ounces.
Distilled water	2 ounces.
Strong solution of ammonia	12 drops.
Iodide of ammonium	10 grains.

Some operators add a little white sugar, in order to give more suppleness to the albumen coating.

Q. How is the albumen to be applied?

A. The collodion plate, having been allowed to dry for about a minute, should be placed on a levelling stand, and as much of the iodised albumen poured over it as it will hold. The superfluous quantity may be returned to the measure; after which the plate should again be covered, and so on for three times; ultimately being drained of the excess of albumen, and stood up against the wall to dry.

Q. How long will it take to dry?

A. Generally about an hour. The face of the plate must, of course, be turned inwards. It should be stood on a pad of blotting paper, and only at one point of its upper edge should it be allowed to touch the wall.

(To be continued.)

Correspondence.

PRESERVING NEGATIVES WITH TALC OR GELATINE PAPER.

Sir,—Nearly two years ago I succeeded in transferring a collodion negative on to talc, and printed from it quite as well as if it had been on glass. Finding, however, great difficulty in obtaining the talc in sheets of any size, I put the negative and prints away, and cannot now find them, or I would send them to you. It would be an excellent substitute for glass, and the film is readily made to adhere to it by gumming the surface very smoothly with clear white gum-water, and, when nearly dry, placing the negative on it in the same way I recommended for transferring collodion positives to paper. The face of the negative might be preserved by placing over it a piece of the gelatine paper, and I should prefer making a narrow band of gum-water round the negative, and, when nearly dry, pressing the gelatine paper carefully on to it. It is better than gumming a strip of paper on to the edges, as that causes a slight ridge which would prevent the face touching the sensitive paper. I have tried putting the negative, while wet, on to the gelatine paper, and, with great care, this would answer very well; but if it should not be very closely done, the negative might be spoiled, as it is impossible to separate it afterwards. I think large negatives might easily be preserved between two sheets of gelatine paper. One to be put on to the negative while on the glass, which is very readily done in the following manner:—Coat the plate with transferring varnish, only just thick enough to ensure the film separating from the plate; dry with heat, and, after placing in water, remove the moisture with blotting paper. Then, with a camel hair brush, put on a narrow band of gum-water round the edges, and carefully (when the gum-water has dried a little) place on the sheet of gelatine paper, press slightly till quite dry, and take up the film from one corner, when the whole can readily be lifted from the plate. Then preserve the back by another sheet of the gelatine paper, placed on in the same way. By this means the negative will be perfectly protected, and if the gelatine paper should get scratched, a fresh sheet can be put on, as the other can be removed by passing hot water with a brush over the adherent portion.—I remain, dear sir, yours truly, Thomas Barrett.

Reigate.

PHOTOGLYPHIC ENGRAVING.

Sir,—I have been trying Mr. Fox Talbot's photoglyphic process as detailed by you at page 73 of the "News," but have utterly failed; is it that there is something omitted in the details given?

1st.—I have found it very difficult to spread the solution of gelatine and bichromate of potassa on the zinc plates, and only succeeded by immersing them for a moment in water, and draining them previously.

2nd.—The heat of a spirit lamp made the coating boil and blister. This I tried to obviate by drying the plates before a fire. This gave me a coating something like what is seen on crystallized tin: all in waves, but nothing of the prismatic bands mentioned.

3rd.—After exposing under a glass negative no change whatever appeared, nor any trace of a picture, though I tried several experiments, exposing from two to thirty-five minutes.

4th.—The solution of perchloride of iron did not appear to act at all, at least very slightly, and nothing like a picture resulted.

I made all the solutions myself, just as detailed in the "NEWS." The peroxide of iron I made by exposing sulphate of iron to a strong heat in a crucible. This I dissolved in hydrochloric acid, and evaporated to a syrupy consistence.

Now, sir, I cannot understand the cause of my failure, and shall feel obliged by any information you can afford me through the "NEWS."

If I had produced any etching, however bad or imperfect, I should not have written to you, but would have continued my trials till I succeeded, but having so completely failed induces me now to apply for further advice.

Carlow, Ireland. M. M. D.

Photographic Societies.

LONDON PHOTOGRAPHIC SOCIETY.

THE anniversary meeting of this Society was held on Tuesday last, the Lord Chief Baron Pollock in the chair.

After the usual routine business had been disposed of, the President rose and addressed the meeting at considerable length. He lamented that there had been no important discovery in photography during the past year on which he could have the pleasure of dwelling. He referred briefly to what had been done in carbon printing, and dwelt on the fact that attempts which had been made to repeat the experiment made by M. Nièpce de St. Victor in storing up light had been unsuccessful, and suggested that this must have arisen from the experiments having been made under less favourable conditions than those under which the distinguished foreigner referred to had succeeded. He next referred to the present exhibition of photographs, which he pronounced to be the best held hitherto, and spoke of the interest with which the Prince Consort had regarded the pictures exhibited on the occasion of seeing them in his company. He regretted to inform the meeting that the financial condition of the Society was not very flourishing, forty-five pounds having been lost by the exhibition at Kensington, and a further sum of seventy pounds by the supplementary exhibition at the Society's Rooms, so that the expenditure of the Society during the past year had exceeded the receipts by fifty-five pounds; but he did not conceive it would be necessary for him to announce—as the Chancellor of the Exchequer would do under similar circumstances—that any additional tax should be levied on the members, especially as there was every prospect of the present exhibition being a profitable one. In the course of his address the learned President alluded to a theory, propounded by Mr. Grove at a meeting of the Royal Institution, on the subject of light, which that gentleman conceived might bear the same relation to gas that gas bears to liquid, and expressed an opinion that that theory was without foundation, and that in his opinion the vibratory theory was the correct one; and that, moreover, if any important discovery with respect to the nature of light were made, it would be by means of photography. The speech of the distinguished President, which was characterised by much ability and no little humour, was received with considerable applause; and, perhaps, this may be the place to remark that the calmness and impartiality of the President may well be observed as an example by the occupant of the chair, whoever he may be, between this and the next annual meeting.

The address of the President was followed by the reading of the report by the Secretary, in which the fact as to the financial condition of the Society embodied in the speech of the President was dwelt upon at some greater length; and great stress was laid upon the impartial (?) manner in which the journal of the Society was conducted.

Upon the Secretary resuming his seat, Mr. Bishop rose to object to the reception of the report until the members had received a detailed statement of the manner in which their money had been disposed of. He complained that the members were kept in entire ignorance of the proceedings of the council, and that, practically, they had no share in the management of their own affairs. He also referred to the promise that had been made, that an amended form of rules should be drawn up, a promise made a long time ago, but which had never yet been fulfilled; and expressed a hope that Mr. Foster, who at that time was an ardent advocate for the revision, should not, now that he was elected a member of the council, forget—like a good many individuals under similar circumstances—now he was in office, the opinions he had expressed when he was out of office. He commented on the announcement that the council of the Society was about to apply for an injunction against a journal for assuming a similar title to its own, and expressed an opinion that, in the event of their doing so, the bill would be dismissed with costs, and then the Society would not only have to pay its own costs in the matter, but also that of its opponents, which would probably amount altogether to some hundreds of pounds. He concluded by putting the question to the President whether or not a bill had been filed in chancery. Previous to this, however, he complained that the council should have thought proper to enter into such an expensive matter without first ascertaining the wishes of the members of the Society. The speech of Mr. Bishop was received with marks of approval from the majority of the members present.

In reply, the President expressed his belief that no application on the subject had yet been made in the court of chancery; but he would not allow that the council ought first to take the opinion of the Society before acting for its benefit. With respect to the statement of account asked for by Mr. Bishop, he admitted the right of that gentleman to ask for it; and advised him, if he were not satisfied, to move that the adoption of the report be adjourned until the next meeting.

This suggestion was adopted by Mr. Bishop, who moved accordingly, and his motion was seconded by a gentleman, who showed his consistency, when the question was put to the meeting by the President, by refraining from voting; and when this motion had been rejected on a show of hands, and the affirmative motion was put to the meeting, viz., that the report should be adopted, by voting in that sense.

Mr. Malone then rose to object to the reception of that paragraph of the report which referred to the impartiality, &c. of the manner in which the Journal was conducted. He complained that the reports in it of what was said at the meetings were extremely erroneous; that statements were imputed to him in it which he had never uttered, but the very reverse of what he really did say. He likewise considered that the supplementary number published each month was calculated to injure the sale of the Journal from the nature of its contents, and was proceeding to strengthen his statements when—Mr. Fenton rose, and, in a rather cavalier manner, interrupted him by remarking that he, Mr. Malone, could not have paid attention to what had been read, or he would not have made the remarks he had. Mr. Malone was about to justify himself, when he was told by the President that he was out of order in speaking a second time on the same subject; upon which Mr. Hughes rose in support of Mr. Malone, and reiterated what that gentleman had stated with respect to the inaccurate manner in which the reports of what was said at the meetings were published in the Journal; and quoted an absurd statement which was attributed to him, and which should have been corrected by the editor, even if it had been made by the reporter,—a fact which the subsequent discussion rendered somewhat doubtful. As a remedy for this, Mr. Malone suggested that the manuscript report should be sent to each of the speakers to be corrected by him; but no resolution was come to on the subject.

Mr. Bishop again rose, and in reference to the statement contained in the report relative to the impartiality with which the Journal was conducted, remarked in sarcastic terms on an article published in it attacking the "PHOTOGRAPHIC NEWS," and expressed his satisfaction that the council had not since committed itself in any such discreditable manner. He made some further remarks in praise of this journal, which were received with applause by many of the members present.

The election of the officers for the ensuing year was next proceeded with, but the impatience of the greater part of the members to be gone was such as to make them forget the respect due to the learned gentleman who does them the

honour to preside over the Society; and it was only on Mr. Bishop rising to remind them of what was due to the chair, that they were recalled to a sense of decency. The proceedings were concluded by the last-named gentleman paying a well-merited tribute to the able and impartial manner in which the President had conducted the business of the evening, and an expression of his regret that, in consequence of his more important avocations, he, the President, was prevented from attending the meetings oftener than once a year. He moved the thanks of the meeting to him, which motion was warmly applauded by the members who still remained; and the President, after returning thanks, announced that the next meeting would be held on the first Tuesday in March next.

North London Photographic Association.

At the last meeting of this association a paper was read by Mr. Legg, "On the Delineation of Microscopic Objects by Photography with Artificial Light." This paper was illustrated with the apparatus employed: it consisted of a long board on which were arranged the camera with microscope adjusted to it (as described at p. 4 of the "Photographic News"), the source of light, and condensing lenses. The only novelty which the author professed to introduce was, the arrangement of the condenser: this consisted of two bull's-eye lenses of respectively one and two inches diameter, placed near a small camphine lamp, in such a manner that the rays of light from it were condensed and rendered parallel; no advantage was obtained by concentrating the rays upon the object by any further lenses, &c. The photographic process employed was ordinary wet collodion, developed first with sulphate of iron, and afterwards intensified with pyrogallic acid. The times of exposure varied from three to ten minutes. With respect to the best method of adjusting for the difference of the visual and chemical foci, Mr. Legg stated that he had lately added to some of his object glasses of long focus a lens of low power, which effectually corrected the focus without any further adjustment.

The chairman, Mr. W. Hislop, stated that in his opinion the best plan was to take a negative of about one inch in diameter, and afterwards enlarge from that. He also approved of the method of correcting the difference of chemical and visual foci of the microscopic object glass, by adding to it a common spectacle glass. He kept several of these lenses by him, of from three to thirty inches focus, and, by a few experiments, he found the one which was best suited to any particular object glass.

Mr. Hannaford then brought forward some improvements which he had made in the iron printing process, described in the "Photographic News," p. 239. He stated that he had substituted albumen for the gum arabic, and found it much superior. He used albumen with either once or twice its bulk of water added to it, and well beaten up in the usual manner. This was saturated with bichromate of potassa and a certain quantity of ammonio-citrate of iron was added to it; this varied according to the strength of the negative, being ten to fifteen grains for those which had strong contrasts, fifteen to twenty grains for good negatives, and twenty to thirty if they were faint and over exposed. The author took thick French paper albumenised as for the ordinary printing process; this was floated for two or three minutes on the above solution, and then hung up to dry. When dry the sheet was exposed under a negative in the usual way, but Mr. Hannaford omitted to give any idea of the time which was requisite for this operation, or the appearance which the sheet should assume when it had been exposed sufficiently. After exposure it was to be washed for not less than half an hour, but as much longer as convenient; it was then ready to be transferred to a bath prepared with liquor ammoniæ, one ounce; water, one pint; in which it should remain for about five minutes; this had the effect of clearing the white parts of the picture; then, after rinsing in water, it was placed in a solution of one grain of chloride of gold in four ounces of water, in which it must remain for five or ten minutes, after which it will be ready for the developing operation. This was effected by pouring over it a saturated solution of gallic acid, and when the details were sufficiently out it was to be washed once in boiling water. In case of over exposure the gallic acid might not bring out the details sufficiently; in such a case a little of the ammonia solution poured over would have an almost magical effect.

Miscellaneous.

Parisian Photography.—A revolution has taken place here in the department of photography. Hitherto, when great artists, painters, or sculptors have been spoken to upon the subject, the answer has always been—"Photography will be nothing in an artistic sense till some real artist devotes himself to it;" and it was usually added, "No great artist will do that." The real artists, it was supposed, would devote themselves to sculpture, or painting, or engraving, but would not descend to what was regarded as a purely manual process. What has been the consequence? The photographers of France have been either rich men, like M. Aguado, who liked to draw ready-made drawings without the trouble of learning to draw, or men who, like the Parisian homœopathists, fancy they can practice homœopathy without knowing anything of medicine. The merely mechanical part of photography has been until now exclusively thought of, and it has not been understood that the sun's rays might be, as it were, guided and used like a brush. A man, whose name stands high in the arts here, has within a very short time turned his attention to photography as an art. In 1848, even in the very midst of the revolution, all Paris was struck with admiration at a certain medallion, and afterwards at a bust of Lamartine, copies whereof were exhibited at every turn. The sculptor, Adam Salomon, soon rose to celebrity, and his subsequent works have only gone on confirming his just renown. His is the famous Charlotte Corday, which is as familiar to every contemporary eye in Europe as were, sixty years ago, the heads of Roman heroes of the school of David. Adam Salomon is a genuine artist, as those of the sixteenth century understood the word. He abominates mere specialities, and holds that art is everywhere—in the mounting of a bracelet to the full as much as in a triumphal arch. His cameos and enamels were *chefs-d'œuvre*. Now he has taken to photography, and anything so wonderful as the effects he produces it is hard to conceive. He really does, as I said before, use the sun's rays as a brush, and paints with them. The consequence is, that his photographs are not "reproductions;" they are pictures. The finest engraving in the world is not preferable, in an artistic sense, to these portraits I speak of, and the merit of exact resemblance is of course there in all its superiority. A whole day nearly may be spent in Adam Salomon's studio, looking over his gallery of modern celebrities. Here, again, you find another Lamartine, that is as full of art as though painted by Jaques or Rossini, to place by the side of no matter what picture; and a long list of others, too numerous to set down. It is all but incredible the reality of the thing before you, united to the merit of it as a work of art. A few days since, the famous Nadar—the man who "does" the photography of the whole world—went to see this gallery. At the first inspection he was quite taken aback, and murmured, "Yes! this is the last expression of photography!" but a few minutes after he added, as though speaking to himself, "Ah! bah! I don't care—it will not hurt me." And Nadar was right. The crowd is everywhere unartistic, and nowhere more so than here; and the million will flock to the mere mechanic, who "does" Cousin or Villemain indifferently, with his tailor or *porteur d'eau*—and the *élite* only will apply to the real artist, who forces the sun to paint a picture.—*The Literary Gazette.*

Micro-Photography.—M. H. Garbanati writes as follows:—I was recently handed two small pieces of glass, in the centre of one of which, by dint of close and painful examination, I discovered a speck about one-sixteenth of an inch in diameter, which bore somewhat the resemblance to a portrait of a head; in the other was also a speck about one-eighth of an inch in diameter, but which I could not recognise as any particular object. By holding the first piece of glass up to the light, and looking through a powerful magnifier, I discovered a perfect portrait, and in the other a group of five portraits equally perfect. To what use might not this mode of photographing be put! In war the most elaborate instructions might be carried in a button or the head of a pencil case, and the general or secretary of war needs but a magnifying glass to save the use of spies, and men from hanging; the whole archives of a nation might be packed away in a snuff-box. Had the art been known in the time of Omar, the destruction of the Alexandrian library would not have been a final loss.

Photographic Notes and Queries.

SINGLE AND DOUBLE LENSES FOR LANDSCAPE PHOTOGRAPHY.—DEAD BLACK FOR BRASSWORK.

SIR,—I am obliged to you for your answer to my query respecting the relative advantages of double and single lenses. My question, however, was prompted by your reply to one "Chirurgus," at p. 72, in which you say:—"A portrait lens should have small stops to fit in front of the first lens, and it will then do for views, although not quite so well as a proper view lens." Now I have for more than five years used a double combination for views—both large and stereoscopic—but I have always placed the stop *between* the lenses. My largest has a focus of nine and a half inches, and with this I make pictures 10 × 8, which are in perfect focus throughout. With this lens I have never experienced the centralisation of light which you mention; but I have experienced it with the stereoscopic lenses, whenever I have attempted to take a view with the sun-rays at an angle of, say 35° or even 40°, with the direction of the camera. But I conceive that a stop in front, in addition to the stop in the middle, would obviate this, as it does with the view lens. The late Mr. Archer was, if not the first, *one* of the first to use the stop between the lenses. The chief objections to view lenses in my eyes are the limited angle of view, the longer focus, and the destruction of the parallelism of the vertical lines. They make buildings at the sides of the picture converge to a point outside the top of the picture.

My reason for putting the question to you was, that I imagined there must be some advantage in view lenses with which I was unacquainted.

You ask in a former number for a recipe for producing the dead black surface on brass, such as is on diaphragm plates of microscopes. I believe that opticians have only two modes of producing a black surface, and one of these is by means of chloride of platinum: you first clean the brass so as to free it from all grease, with the finest emery paper, and immediately slightly warm it and lay on the chloride of platinum with a camel-hair brush; you may then put a thin coat of lacquer over it.

The dead black is produced in the inside of camera or microscope tubes by applying to the heated brass, with a brush, lacquer in which has been mixed some lampblack. The lampblack should be well mixed, by grinding it up with a little lacquer on a slab or piece of glass. The lacquer should not be too thick. The brass should be heated to about the temperature of boiling water.

The best lacquer is made by simply melting shell-lac in spirits of wine, without heat; when dissolved, pour off the clear liquor for use.

For small work, the workmen, I believe, make their own lampblack, by holding, contemporaneously, a piece of brass or tin over a gas flame. It is then free from grease and very fine.

The brighter black surface, like enamel, on the end of eye-pieces of microscopes next the eye, is produced by the same process, but the surface is afterwards smoothed, and then lacquered. H. E. N.

COLOURING GLASS POSITIVES FOR THE MAGIC LANTERN.

SIR,—Not one of the least interesting and instructive applications of photography, is the easy production by its valuable aid of slides for the magic lantern. In place of the florid, uncouth, ugly daubs, with which the youth at our christmas parties, missionary meetings, and astronomical lectures were wont to be regaled, they now have lovely and faithful delineations of nature, sketched and shaded by the glorious sun. But, as if to leave a little credit to be gained by mortals, we are allowed to colour those matchless pictures ourselves. How to accomplish this properly, so as to keep all the delicacy and detail of the positive, is a secret, the knowledge of which I should prize highly, especially as I have tried my hand already without much success.

I obtained my glass pictures from good negatives by transmitted light, by the same process as that mentioned in a recent number of your valuable journal. I used a single gas jet, intensified by having a silver reflector behind, the negative being next the light, and the sensitised plate nearly in contact with it. Ten seconds is sufficient to give admirable pictures, which, on being treated with chloride of gold after development, became beautifully transparent. Here, however, my success terminated, and my difficulties began.

Having provided myself with a box of water colours for glass painting, I found the utmost difficulty in causing them to adhere to the varnished surface. Not, I believe, from any fault in the pigments, but from my own inability to apply them. Ultimately I succeeded in producing a slide which showed pretty well on the white screen, but it was totally devoid of delicacy in detail and depth of colour; the picture having materially suffered, as I thought, from the accumulated coats of varnish.

I believe a few practical instructions in this description of colouring would be of vast service to many artistically inclined individuals located in country districts, among whom no one would feel more obliged for a few hints than, yours respectfully, WILLIAM COCHRAN.

Glasgow.

WASHING POSITIVE PRINTS.

SIR,—I have just had made and registered a bath for washing prints rapidly, by letting a stream of water flow on them for half an hour, when any print (as is well known) will be found sufficiently washed. There have been a great many contrivances of late for this purpose, but none to my mind so simple as the one I am now writing about. The bath is made of deal, in the shape of a trough, standing on four legs, about two to three inches in height, according to the size of the trough. The bottom of the trough is perforated with holes; *inside* this trough I put either a porcelain or pewter *inner trough*, with a top to it, which, with the bottom, is also perforated with holes. The prints are put within the porcelain or pewter trough, and the whole placed under a sink, to the cock of which I hang on a long wooden pipe, of the form of those used for pouring the water from the pump into the water cart. Of course the water runs through this "gutter" (I will call it) on the perforated china pan inside the wooden one, and empties itself from the bottom, so that there is continual running of water for as long a time as is wished. My object in having the top perforated is to scatter the water without its coming heavily in one place, which so often hurts the print by creasing, &c. A sliding top shuts up the whole affair when done with, and makes a capital packing case for carrying one's apparatus about in when travelling. I have also invented a new tent, very small and portable, for changing the plates in the dry process in the open air. I have now practised photography for some years, and shall be only too happy if I can add to it some convenient and improved apparatus.

A PRACTICAL AND HARD-WORKING AMATEUR.

[We shall be very happy to receive a description of our correspondent's improved tent.—ED.]

GLAZE FOR COLOURED STEREOGRAMS.

SIR,—Can any of your correspondents inform me of the best mode to pursue in varnishing or glazing coloured stereoscopic slides?

I have, I flatter myself, coloured them well, but must confess that the varnishing process has hitherto defied all my efforts to produce a good, clear, even-varnished surface. The *modus operandi* in my hands has resulted in removing the colour, on applying varnish, gum, or indeed anything calculated to give a gloss. Your superior knowledge is invoked to help a poor fellow over the style.

A SUBSCRIBER.

BLACK VARNISH—COLLODION POSITIVES ON BLACK PAPER.

Sir,—I can recommend the following receipt for a good dead black, to answer almost any purpose where a dead black is required:—Take as much drop black as you think will be sufficient for the work you intend to do, grind it with turpentine, then add as much japanner's gold-size as will bind it fast; any house or coach painter will prepare it for you.

Process for taking Positive Photographs on Paper, Direct in the Camera.—Take any kind of smooth paper, give it three coats of black japan, let it dry and harden a day or two, then procure some pumicestone, grind it very fine in water, same as grinding paint, then take a piece of fine cloth and rub the surface of the japanned paper with the pumicestone until you have a fine surface; it is then ready for use. Float the paper plain side down on a dish of water, let it drain a moment or two, then lay it on a piece of glass, a little larger than the paper, then proceed to pour on the collodion and manipulate the same as on glass. The collodion should be a little thicker than for glass, and it requires a little longer exposure in the camera. I can take them on paper equal to those on glass. E. R.

SYNOPSIS OF PHOTOGRAPHIC PROCESSES.—COLLODION ALBUMEN.

Clean plates.
Coat with collodion; let well set.
Place in bath 1′; get rid of oiliness.
Wash well.
Drain 1′.
Pour albumen on and off several times.
Dry; not by artificial heat.
Place in bath 1′ to 3′, soon before use.
Dry; not by artificial heat.
Expose.
Moisten with water.
Develop.
Wash in a little common water.
Fix.
Wash in abundance of distilled water. H. S. I.

ANSWERS TO MINOR QUERIES.

Supporting large Glass Plates.—*W. Dickson.* We do not much like *plate-holders* for this purpose; those in which the plate is held by a screw are very clumsy, and the pneumatic plate-holders (according to our experience) generally let the plate drop just at the critical moment. The plan we prefer is, to hold one corner of the plate by the finger or thumb in the ordinary way, and then rest the opposite corner on the edge of a table or similar convenient support. By this means all the usual alterations in position may be made without the least inconvenience, and without its being necessary to remove the corner from the support. Another plan which we have found useful is, to place a stone-ware bottle, holding about a gallon, on the table, fit a cork tightly into the mouth so as to allow part to project, and then, having the bottle half full of water to give it steadiness, support the plate in a convenient spot near the centre on the cork, still holding it by one corner as usual.

Poisonous Effects of Cyanide of Potassium.—*An Amateur.* The ordinary positive developing solution made with protosulphate of iron, is the best antidote to the poisonous effects of this salt. If necessary, it may be taken internally without danger (unless other substances of a deleterious nature have been added to it, such as nitrate of baryta in excess, or perchloride of mercury), or it may be applied externally to a wound, if cyanide of potassium has got into it. The presence of a little nitric or acetic acid is of no consequence.

Candle Light in the Dark Room.—*E. H.* You may, without fear, have your dark room illuminated with a candle, unprotected with yellow paper or glass; remember not to have the light within two yards of the plate, if a rushlight or common dip; or within three yards of it if it be a wax or composite candle. Be very careful, also, not to allow the vapour of collodion to approach the light, as it is very inflammable.

TO CORRESPONDENTS.

☞ Some complaints having been made by our subscribers as to the non-receipt of the "Photographic News," the publishers beg respectfully to notify that every care is taken on their part to insure punctual and correct dispatch. All complaints should, therefore, be made to the Post Office authorities.

We must beg our correspondents not to send glass plates through the post, except they are securely protected against breakage.

T. C.—1. Telescopic object-glasses are far more expensive than Photographic lenses of the same size, but we cannot tell you the exact price, as they vary with each maker. 2. In *front* of the lens as stated.

Delta.—1. We cannot suggest any other plan than those you name; all methods of preventing passers-by seeing through your glass window will diminish the light. 2. We have used the paper you mention very successfully, but know nothing much about its mode of preparation.

W. L. C.—1 and 2. See our Dictionary in the last number. 3. See p. 180. 4. We are sorry we cannot suggest any better plan than the one which you have described.

Piscator, Cape of Good Hope.—1. The postage is 1d. each copy; we shall therefore send the "Photographic News" weekly. The cash sent will pay to No. 30 inclusive. 2. The price for stereoscopic negatives varies from half-a-guinea to five guineas, or more.

A. D., Broad-street.—Photography by Lake Price.

J. B., Notting Hill.—We are sorry for your case, but can hardly venture to advise upon such a matter; your best plan will be to apply to some well-known photographer and colorist, with whom you might possibly come to some arrangement.

J. C.—The best strength must be found out by experience.

A Struggler.—1. It is usually the case that in endeavouring to make a lens applicable to both purposes, they succeed in neither. 2. Un-iodised collodion will answer better for a cut than solution of gutta percha.

T. T.—1. We cannot suggest a better plan for your glass room than the one you propose. The light would be very good, and would, of course, require to be subdued with blinds if the sun were shining. 2. Enamelled iron tablets, if good, may be used exactly as glass plates in taking collodion positives. The same chemicals and exposure will be required. 3. We hope to give a full description in a short time.

Stereo.—Professor Wheatstone was the inventor of the stereoscope.

Libel.—1. Place the vignette glass *outside* the glass of the pressure frame; thus, both it and the negative will be safe from breakage. 2. The collodio-albumen process, as described in recent numbers of the "Photographic News," is the best of all. 3. Apply the shell-lac varnish warm, and slightly heat the plate whilst drying.

Perseverance.—The fault is in the toning process. Try the one given at p. 86.

G. J. Jones.—1 and 2 have been already answered in recent numbers. 3. We expect to give a description of the best *instantaneous movement* yet out in an early number.

Chemicus.—We have cases for preserving the numbers of the "Photographic News" at 1s. 6d. each, post free, 1s. 8d.

H. S. I.—1. Use an old red collodion, and you will easily obtain as much absence of half-tint as you want. On the other hand, to obtain more half-tints in your stereograms (which *are* rather snowy), use a nearly colourless cadmium collodion, and expose longer in the camera. 2. We are obliged for your hint, and will proceed to carry it out; we hope to be able to give a much fuller table than the one you have favoured us with. 3. Fully explained at p. 240.

A Photographer of some Standing.—The suggestion is received with thanks.

A Visitor in Ryde.—Received.

C. E. C., Cornwall.—Good clean corks may be advantageously used for the collodion developing and fixing solutions instead of glass stoppers; but the latter must be used for silver solutions, as organic matter will be likely to decompose the nitrate of silver.

J. O. E.—Your suggestion is ingenious, but impracticable.

Not up to the Mark.—1. The cause of gold-coloured stains on albumen paper is fully explained at p. 59. 2. You can obtain greater softness in your pictures by exposing rather longer, or by adding one grain of bromide of cadmium to the ounce of collodion.

B. H.—We are obliged for your suggestion, and will bring the subject before our readers as soon as we have given it further consideration.

A Welsh Amateur.—The nitrate of silver was reduced to the metallic state by the organic matter forming the cement with which the glass bath was joined.

J. D. C. O. E.—You should have no stop with a double lens if you wish to take very rapid pictures. We shall be very pleased to receive a description of the piece of apparatus you name.

J. Grant.—Your picture arrived so completely smashed, that we were not able to examine it very well. We should, however, recommend the collodio-albumen process.

F. L. G.—1. We do not much like the negative printing process. You will be able to obtain the tint you require by the process given at p. 86. 2. A twin lens camera.

Mo. Cy.—Your pictures of Ramsgate and Margate are very excellent.

F. H.—We will see if we can organise some such plan as the one you suggest.

Communications declined with thanks:—Old Phos.—P. L.—X. A. F.—C. P.—Hypo.—One Month.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—Williams.—E. S.—F. A. D.—L. T. C.—G. L. A.—C. W.—T. O.—Turk.—100.—A Photoglyph (see this number).—Thompson (no).—Glass.

In Type:—T. W. H.—M. D.—W. R. S.—X.—D.—G. E.—J. S.—V.—H. S. I.—T. B.—F. P.—J. W. W.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Cassell, Petter, and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 23.—*February* 11, 1859.

PHOTOGRAPHY IN WESTERN INDIA.

WHILE we read in the home papers of such triumphs in photography as a likeness of Mr. Charles Dickens so exquisitely minute that its beauty and fidelity are only discovered by the use of a powerful microscope, and of a whole family portrait gallery being inclosed in a signet ring worn by the Queen, it is gratifying to be able to record that the practitioners of this useful and interesting art are, in this country of our temporary adoption, giving unquestionable proofs of steady progress. We have before us Nos. 18 and 19 of *The Indian Amateurs' Photographic Album*, published monthly under the patronage of the Bombay Photographic Society; and we must say that the specimens reflect immense credit upon the artists engaged in their production. The labours of the local Society to preserve, by this delightful process, the memory of Indian antiquities, which are fast crumbling into decay and mere oblivion, have not been commenced a day too soon. What would "Old Mortality" not have given for the use of such an art as photography? which would have rendered his researches through ancient graveyards a hundredfold more easy in the process, and satisfactory in the result! What a happy man would John Britton have been, had his long and arduous labours been lightened by this inestimable auxiliary, when he was preparing his famous work on "Cathedral Antiquities!" And how thankful should cotemporary archæologists and ecclesiologists be, that their lot has been cast in days so much more propitious for the pursuit of their favourite studies!

The representation in the collection before us of the entrance to the Monolithic Temple of Kailas at Elora, photographed by J. N. S., is a good example of what can be done by this art to rescue from "the tooth of time and razure of oblivion" the monuments which abound in India of past greatness, and a zealous though deluded and misdirected piety. By the observations that accompany this work, we are reminded that the religious excavations at Elora are the most famous in Western India, not only on account of their number, magnitude, and excellent workmanship, but because of the variety of the forms and uses of their several groups, devoted respectively to Budhist, Brahmanical, and Jaina religions. Dr. Wilson tells us that the Budhist excavations were formed about the Christian era, and the Brahmanical probably about A.D. 917; and that from an inscription still readable, the Jaina excavations are not 700 years old. The temple of Kailas—the entrance to which is photographed with great effect—was dedicated to the Brahmanical god Shiva, after whose heaven it is named. "It consists not merely of excavated apartments with mythological and ornamental figures, but of a roof with towers and steeples, all cut out of the solid rock. It is surrounded with minor temples, in which almost all the deities of modern Hinduism are represented." And finally, we are told, rather unnecessarily, that "the workmanship is much superior to anything now executed by the natives of this country." Vestiges, like these, of past grandeur and glory, are suggestive of serious reflections, and, next to a personal examination of them, perhaps the best aid to our thoughts is the perusal of the faithful and clearly defined lines in a photograph like that before us.

In the same part of the *Album*, there is quite a different pile represented, albeit also a temple—that of Dhakaleshwar at Breach Candy, the pyramidal tower of which is familiar to many of our readers. It, too, fully confirms the remark about the inferiority of modern to ancient workmanship in this country. This religious edifice was built by Dhakaji Dadaji, Esq., a late citizen of Bombay; and it has had the misfortune to fall into neglect before falling into decay, for it still seems to be in *pucka* condition. Although its ambitious founder united the name of the deity with his own in the title he gave to the temple, it never has been popular; it is seldom visited, and even its annual festival attracts few worshippers.

We come now to another scene, in which the objects represented are not architectural fabrics, ancient or modern, but flesh and blood, although like the former associated with a benighted faith—we mean the portraits of a well-known Hindoo controversialist, the Brahmachari Bawa, Vishnu Bhiku, and one of his disciples.

The following description of this famous theological debater accompanies the photograph:—

"Vishnu Bhiku, well-known of late in Bombay as 'The Bawa,' is by birth a Brahman. He is said to have been an official in a government office before he commenced the practice of the gentle religious austerities which he now observes, especially in the matter of dress. A few years ago he appeared as a religious disputant and instructor at Kolapoor. He commenced his public labours at Bombay in 1856. 'He challenged all the world, and missionaries especially,' says the Rev. Mr. Bowen, 'to discuss with him the relative merits of Hinduism and Christianity.' But he showed no disposition to encounter them on equitable terms of debate. An invitation to do this, which was addressed to him, he, in fact, either neglected or declined. After his discourses at the sea shore—which continued from the 15th January to the setting in of the monsoon of last year—he usually allowed some of the missionaries of Bombay to reply to his remarks, and proceeded to hold with them very keen discussions. Mr. Bowen, in particular, vigorously exposed his representations and reasonings, of which he has furnished a correct report in a little volume entitled, 'Discussions by the Sea-Side.' The Bawa, of late, has been very quiet in the community; and report has it that he is writing a book which will be a better test of his powers than any verbal addresses which he has yet delivered. As he has been so kind as to sit before us for his picture, we leave the public to form its own opinion of his marked physiognomy. His shirt is that generally worn by Sanyashis. His pots and staff and unostentatious turban complete his equipments. One of his disciples, a well-known Sonar in Bombay, is sitting on the ground before him, but he seems more occupied with his *granth* than with his *guru*."

On the part of the public thus invited to do that which delicacy prevented the photographer from doing, we have no hesitation in saying that the features and forehead of this Hindoo orator would not have been despised by Lavater and Spurzheim, when looking or feeling for intellectual capacity and energy. With a bright eye (which might be of great help to an eloquent tongue), a well formed mouth, and lofty *os frontis*, the effect of the whole countenance is grave and impressive, if not commanding. The Bawa, with all his religious austerities, may have had some little pride when he brought to the artist's studio the companion, who is squatted on the floor, for we must say that the wrinkled features, sunken eye, receding forehead, and mis-shapen person of the disciple make an admirable foil to the face and figure of his master.

We have no room at present to notice the contents of Part 19. They are also exceedingly well executed, and consist of "The Fort of Bombay, from the Apollo Bunder," by W. Johnston; "The Native Knife-Grinder and his Assistant," by the same artist; and "St. Mary's Church, Poona," from

a collodion negative by Henry Hinton. We may return to these should opportunity permit, but meanwhile we recommend this spirited and well-conducted undertaking to the cordial support of our readers.—*Bombay Gazette.*

GENERAL OBSERVATIONS ON PHOTOGRAPHIC POSITIVE PROOFS.*

BY MM. DAVANNE AND A. GIRARD.

ON SENSITISING—(*continued*).

Of Organic Substances dissolved in the Bath.—It is certain *à priori* that every sheet of paper floated on the silver bath yields to it, through dissolution, a portion of the size which covers it, whether that used in the manufacture, or that added: the effects of it have been well observed already; therefore, we shall here only recall the facts known by almost every photographer.

The addition of starch to the bath in the weak proportion involved in photographic manipulations, produces no effect either on the bath or on the proof; but it is not the same with two other substances employed in sizing, *viz.*, albumen and gelatine.

The gelatine size used in the manufacture of the paper, by dissolving even in a minimum quantity in the bath, communicates to it the property of becoming turbid and brown in the course of a few hours. If we ourselves add an additional sizing of gelatine in the preparation of the paper, this action is much more energetic. The silver bath dissolves a considerable proportion, and soon colours on contact with atmospheric air. On a large surface like that of a dish, the same reaction results—an insoluble and coloured combination is formed, swimming at first on the surface; and the paper prepared on such a bath is covered with marble-like stains, at the same time that they are rapidly tinted over their whole surface. Albumen, which is daily used in photography as an additional sizing, also possesses the property of altering and discolouring the bath, especially if the bath is rather weak or the temperature low. In these cases it is necessary to decolorise the bath; and two processes have been proposed to effect this, which are based on the employment of animal charcoal or kaolin. We will add a third, the efficacy of which we have discovered, and which is based on the precipitation of the chloride of silver.

1. *Animal Charcoal.*—This process, which is the first that suggested itself, is nevertheless the worst. Animal charcoal, in fact, whether pure or washed, possesses the property of rapidly diminishing the strength of the bath. Thus 2 grammes of washed charcoal (of commerce) have taken from a bath 1·2 gramme nitrate of silver. This enormous loss, which equals more than half the weight of charcoal employed, is undoubtedly due to the chlorides, or to the hydrochloric acid retained by the charcoal after the washing with this acid.

If unwashed charcoal be taken, the loss is less considerable; it is only one fourth of the weight of the charcoal used, and must be considered as due to the free lime which the charcoal contains after its calcination, which precipitates oxide of silver on the charcoal.

In every case, then, charcoal ought to be rejected. As a subsidiary question, we have examined if the bath decolorised by the charcoal had, as several writers have pretended, a dissolving influence on the albumen. We have not found it in the least so in the case of positive papers. Nevertheless, it appears that this is sensibly so in the case of negative proofs. It may be explained thus—that the weaker a bath in nitrate of silver, in other words, the more aqueous, the more, in consequence, is it susceptible of dissolving albumen; now, after decoloration by charcoal, the bath has, as we have seen, become greatly weakened, hence the more apt is it to attack the thin film of albumenised proofs on glass.

2. *Kaolin.*—Kaolin is very preferable to animal charcoal, as the strength of the bath is in no way altered by its use. The best method of decoloring the bath by this agent is, to employ it in small successive doses in a finely pulverised condition, and not to put in a large quantity to remain in the flask, because, in that case, its decoloring properties are speedily annihilated.

3. *Chloride of Silver.*—A third process which may likewise be employed when one has no kaolin, and which is, at all events, preferable to using animal charcoal, consists in employing for this purpose chloride of silver. It suffices, in fact, to add to the coloured bath a small quantity of a solution of chloride of sodium (about 8 or 10 drops of a solution at 5 per cent.), and to agitate violently, without waiting till the precipitate of chloride of silver shall have become curdy, and to repeat this operation a second and even a third time, to deprive it of its colour. The precipitate of chloride of silver which is then formed draws down with it the colouring matter, and restores it to a suitable condition. This mode of decoloring is, it is evident, very convenient, since it is always at hand, and is of little cost, for the effect is only to weaken the bath in an almost imperceptible proportion: besides, there is no necessity for throwing anything away; the separated chloride of silver which remains in the filter should be put with the residues. Kaolin is the best substance for the purpose; but in default of that, decoloration by chloride of silver constitutes a method which is both more economical, and preferable to the employment of animal charcoal.

(*To be continued.*)

* Continued from p. 256.

DR. MUSPRATT ON PHOTOGRAPHY.*

If a proof of the great importance of photography were required, we need not go further than the article in this clever work. From this it appears that, not only is an article on photography necessary to render any account of chemistry complete, but to such a length has the subject drawn the writer, that already a great part of No. 48 is occupied, and the article as yet by no means complete. As far, however, as the account goes we will follow, with the hope of gathering at least something from it, and making sundry observations on certain portions.

The first thought that rises in the mind of the reader, if he knows the art, is, that this goes further than any attempt to teach the *theory alone;* it is not as if the article were only inserted to redeem the work from an omission. The details, practical as well as theoretical, are given with every minuteness; different manipulators' formulæ compared; even the effects of certain lenses explained, down to the new combination of Petzval.

He commences by giving the composition of white light, with an engraving showing the seven coloured rays; noticing also the *extreme red* and *lavender rays:* from this he leads us to *actinism*, *light*, and *heat*, showing this also by an engraving. Here we perceive that, at the very point of the greatest *light*, the *chemical power* or *actinism* is absolutely nothing; and where the *light* and *heat* are least sensible, we must look for our work to be done when photographing.

Then comes the Historical Notice. Scheele, he says, was the first to draw attention to the sun's rays having the power of effecting chemical changes upon certain salts, more especially those of silver, and to show the comparative power of the different rays to darken them. He was followed by others; but it was Ritter who first discovered that beams not possessing luminosity, but having great power in producing chemical changes, existed in sunlight. Then Wedgewood published his method of printing on substances washed with silver, but owing to his being unable to fix them, although assisted by Sir Humphry Davy, the useful application of the invention was hindered. Then Nièpce, many years after this, partially succeeded in fixing these silver pictures, and published his "*Heliography.*" A tablet of

* "Chemistry, by Dr. Sheridan Muspratt, F.R.S.E., M.R.I.A." Article, "Photography," No.

plated silver was coated with a mixture of asphaltum and oil of lavender, and dried at a gentle heat; it was then exposed in the camera, and after due time the impression rendered visible by disengaging the affected parts by pouring on the plate one part oil of lavender, and ten of petroleum or spirit of tar, and then carefully washing. Shortly after he tried alkaline sulphides and iodine to deepen the shadows; and though this afterwards was the foundation of Daguerre's method, in his hands it proved no better than the first attempts. Nièpce died in 1833, and his son Isidore joined Daguerre in these experiments, until in 1839 the latter brought out the beautiful process called after its inventor. The French government granted both these men pensions, and its practice became universal. But during these experiments the English mind was at work with somewhat of the same inquiry. Mr. Henry Fox Talbot worked from 1834 until 1839 at his attempts to fix the images made by his camera-obscura, until on the 31st January, 1839, a paper was read by him to the Royal Society: "*Some account of the Art of Photogenic Drawing; or the process by which natural objects may be made to delineate themselves without the aid of the artist's pencil.*" Soon a fuller account of his method appeared, and it would seem as though the world were ready for the discovery, as two men were at work at the same time, seeking the same end, and yet probably one man did not know that the other lived; and neither process has the slightest connection with the other—indeed they are what we may almost term *different in principle*—the pictures of Daguerre being taken directly upon the plate, and those of Talbot having to be reproduced as "positives" from the original or "negative."

Talbot first used chloride of sodium as a fixing agent, then iodide of potassium was used; but these, and others, gave way to Sir J. Herschel's hyposulphite of soda, which continues to be used to the present time, every other substance having given way to it, except in the positive collodion process, where cyanide of potassium is used in weak solutions. Dr. Muspratt says that pyrogallic acid has '*superseded*' the gallic; but in the *paper* and *some glass* processes, the gallic is still used exclusively.

In 1848, Nièpce de St. Victor made the discovery that we called the albumen process; using glass as a support for the iodised albumen, and the pictures had many qualities superior to paper. Then, says Dr. M., Archer introduced collodion, and since that time, excepting modifications, little has been done beyond rendering the art more universal. Xyloidin, a compound prepared from starch and nitric acid, and tinctured with iodine, was introduced a few years since; but, notwithstanding its repute for being a better base of a picture, its use is not near so extensive as that of collodion.

Then, we have the notices of the PHOTOGRAPHIC ENGRAVING, in which the different methods of making the picture engrave itself, are discussed. The latter, he says, which might be called photo-galvanography, is not recent, but almost as old as the first bituminous impressions of M. Nièpce. Dr. Dorme attempted to engrave daguerreotype plates by light, and partly succeeded. Grove, in 1842, engraved the same plates by voltaic agency; where the agent was chlorine liberated from hydrochloric acid, in which the picture was immersed, attached to the positive pole of the battery. Then, in 1844, Fizeau and Claudet obtained a patent for another method; and, in 1853, Talbot published the most satisfactory process up to that time, *i.e.* the gelatine and bichromate of potass. Shortly after, Pretsch of Vienna published a process very like Talbot's; and, lately, Poitevin, of Paris, has used the same materials, and applied them to the lithographic stone with very good results.

Such are Dr. M.'s observations (or rather a summary of them) on the application of photography to the engraver's work; the last invention, however, of Fox Talbot—which is not discussed by Dr. M. in this number, viz., the "Photoglyphic Engraving"—is based on a totally different principle, as the photograph itself lays the etching ground, and the plate is at once made ready for the printer, without needing any electrotype, or other reproducing means. This, all must allow, is the greatest advance made as yet.

The OPTICS of photography are next discussed, commencing with the forms of camera, thence passing on to the different lenses, bringing us down to the *Orthoscopic lens* of Professor Petzval. Here again is, we think, an omission, viz, the principle of the new aplanatic lens is never mentioned. The single lens is noticed as giving a "*flat field but great distortion,*" but Dr. M. forgets that this distortion has been greatly reduced in the aplanatic lens; and an account like this is hardly to be called complete, without the mention of this last great improvement.

The next stage is one which every operator should know at least something of, viz.: THE CHEMISTRY OF PHOTOGRAPHY. This is a short explanation, clearly given, of the change that takes place in the photographic picture, but, as this will be enlarged upon in the different processes, we need not waste space upon it.

The PRACTICE OF PHOTOGRAPHY commences with a description of the Daguerreotype Process, where every stage is separately discussed, and in conclusion this process is declared to be the most perfect of all processes; being unrivalled for microscopic perfection of detail, modulation of shade, and beauty of half-tone; and it is stated to be permanent when properly performed, and sealed in an air-tight case. As to its beauty there can be no doubt. Of all photographic pictures, the most beautiful we have seen were Daguerreotypes of statuary: the whites so brilliantly perfect, the utter absence of anything like solarisation, and the roundness of the figures were certainly unequalled by any other photographic productions we ever saw: but if a Daguerreotype is not *very good* it is *very* inferior; and the manipulation, to attain such perfection, is so difficult that it is seldom met with. The Collodion Process is described at great length, commencing with the description of the kind of gun-cotton required, and the method of making it. The iodising of collodion is then discussed, the advantages and disadvantages of the different iodides enumerated; and then we have the manipulation of the Negative Process. If any portion of the article can be called *the best*, perhaps, this would be it—the account is short, yet full and lucid, going through every stage, from the choice of glass to the kind of varnish. About this last there have been so many inquiries in the journals, that it may be well to give his opinion:—"The best varnish," he says, "is made by dissolving shellac in alcohol, so that it is not too thick to flow over the plate; it must be applied with heat, and when dry this varnish is extremely hard to scratch." Here we have the solutions, the appearance during development and exposure, and the fixing and finishing the picture. The Positive Process is also full and complete; and the operator may here gain that theoretical acquaintance with it, which if a man knows not, he is little better than a mere photographing machine, working without the slightest use of his brain. There are some simple, yet very useful facts, given as to the necessity of an *inorganic* developer; and the reasons, together with sundry directions for obtaining the best protonitrate of iron, which gives, perhaps, the finest results; and Fry and Archer's method of converting the negatives into positives.

In the Dry Collodion Processes, Dr. Hill Norris's comes first, and is described as "extensively employed and giving universal satisfaction." Fothergill's is not described with the fulness we should expect, being referred to as the substitution of albumen for gelatine, all else remaining the same as Dr. Hill Norris's; but here Fothergill states that it succeeds "pretty well if to be kept a few days only." In the short notice of the collodio-albumen, the proportions recommended differ considerably from those in common use; and it is stated to be "more complicated and troublesome than any other, and the negatives are of a bad colour." This, we fear, will bring this very perfect process into bad repute; and though an inexperienced photographer may justly think it troublesome at first, when worked systematically the labour is

little more than other processes require, and the results are fully as beautiful as any other process will give.

The Theory of the Collodion Processes comes next; the sensitive film's composition, the formation of the double salts, the difference of the positive and negative pictures, the free nitrate on the plates, and the fixing, are each noticed and discussed: and here again any man, *truly a photographer*, may gain no little from the study of this short portion of the article, and certainly must feel far greater interest in a subject with which he is theoretically, as well as practically, acquainted.

Finally (of the Glass Processes), the albumen process on glass is given with every detail; coating the plate is well described and rendered as simple as possible: but, we fear in giving the time required for development, viz., twenty minutes, he has made this process far more attractive than it really is, as one of its greatest drawbacks is the long time which it requires for this stage.

Here ends the account of the glass processes, and now what can we draw from this short notice of the article? Can any one either question the growth of this wonderful art, or assign a limit to it? The Cartoons from Hampton Court are its latest wonders; yet the great question of permanency still haunts photography; and how might this be most easily solved? Simply, by every man being grounded, as it were, in the theoretical as well as the practical part of the art before he begins to produce his positive portraits on glass, and sinks down into a satisfied state of mind when he can by *mere mechanism* produce worthless caricatures of his victimised friends. Many inventions are not brought out by the cleverest men; the mind naturally grows to the discovery of some great want, and is then led on from experiment to some unknown yet simple remedy: even by the merest accident many of our grand discoveries have been made.

Our advice is, to every beginner, make yourself acquainted with the theory; then the love of the art will grow and lead you on until you *must* become a photographer, and most probably a *great* one.

FADING OF PAPER PRINTS.

"Some time since a commission of inquiry was formed by the Photographic Society, for the purpose of getting at the cause of fading in the paper prints; and also to recommend the best way of rendering them permanent. Can you, Mr. Editor, give us, in a comprehensive form, the results from the above commission of inquiry, as any genuine information on this important question would be the greatest boon that could be bestowed on the photographic world? My friends, the professional photographers, are beginning to quake with fear and trembling for the great reckoning day when all their good works shall have faded away. It will be as well here to give a little experience of my own. I have been almost exclusively devoted to photographic pursuits since 1851, and have a few prints of that date that are as perfect as when made; but have had hundreds that have faded away, although great care has been taken in their production. This is clearly a proof that the fault is not in the system, but in some of the minor details that have escaped our notice. It seems to me that the main cause of fading is the decomposition of the hyposulphite of soda while in the print; probably, the free nitrate of silver decomposes the hyposulphite of soda, setting sulphur free on and in the pores of the paper: free sulphur being quite insoluble in water, it is not possible to wash it out; consequently it remains in the paper, and gradually forms sulphide of silver with the print on the surface. The slight tinge of delicate yellow, which nearly all prints show, in the light parts especially, if kept in the hypo. gold bath long enough to acquire a fine dark colour, clearly indicates the presence of sulphur in the paper; another proof is this:—take a print, hold it to the fire, then to your nose; *if it is a sharp one*, the unmistakable smell of sulphur is the result, although it may not show on the surface. If some of our theoretical chemists would be kind enough to explain this, the cause, and how to obviate it, it ought to be thankfully received by all the devotees to our beautiful but fleeting art."

H. Francis.

PHOTO-LITHOGRAPHY.

ANOTHER CANDIDATE FOR THE DISCOVERY.

M. Jobard has written a letter from Brussels requesting that a sealed packet deposited by him with the *Académie des Sciences* on the 2nd November, 1840, might be opened. This packet bore the superscription—"Description of Processes of Lithographic Printing of Heliographic Pictures," and the following were its contents:—

"Ever since my first essays in daguerreotype, which I was the first to import into Belgium, I saw the possibility of lithographing heliographic pictures, by receiving the impression of the solar rays on a stone or on a zinc plate covered with iodine. Being myself a lithographer, it was not surprising that I should be one of the first to think of it. The stone or zinc plate, instead of being submitted to the mercury, should be immediately covered with a thick solution of gum arabic, blackened with lampblack, and protected from the light until the coating of gum is dry; then you should plunge it into water to dissolve and wash it. It is afterwards placed in the press, and the roller passed over it; and the result is, the parts of the iodine decomposed by the light have been removed by the gum which has introduced itself beneath, and has *prepared the stone*,—that is to say, has communicated to it the power of repelling the greasy ink, while the undecomposed parts of the iodine take grease perfectly, whether the iodine remains, or whether it vanishes under the sponge used to damp it; pure whites are thus obtained, and proofs perfect in all their parts: but this operation is a delicate one, and can only be accomplished by a very able photographer. The zinc plate is treated in precisely the same way as the stone.

"The great feat consists in scarcely charging the roller with ink. The design may even be charged with greasy ink, if it tends towards impasting, and prepare it with acid, or rather with chloride of lime.

"I take the precaution of sending this process sealed, because I have communicated it under the seal of secrecy to Colonel Wittert, of Liège, who is at present making experiments, which I have not had time to make for a year past."

This note is referred to a committee composed of Messrs. Chevreul, Pouillet, and Regnault.

Critical Notices.

Stereograms of English Scenery and Interiors. By W. H. Warner. London, Ordish.

These views are chiefly of interior architectural subjects,—a department of photography which, we need hardly inform our readers, is one of the most difficult to obtain any great amount of success in. In Mr. Warner's series there is great inequality; sometimes he obtains results which would please the most fastidious, while at other times the pictures are by no means as satisfactory as we should desire: this, we apprehend, is not so much from any fault of manipulation, as from the photographer attempting a subject which would be almost certain to meet with failure. However, in some instances where he has tried his skill upon subjects that others have failed in, his pictures are, considering the difficulties he has had to surmount, decided successes. We think it right to make these remarks because the general public buy pictures, not so much for the photographic difficulties that have been overcome, but because they are pleasing and interesting. In many instances those before us are printed too dark, otherwise they would be entitled to rank as first-rate slides.

"Bishop Grandison's Shrine," and the "Altar Piece, St. Saviour's Chapel, Exeter," are two of the least successful, owing

to the want of half-tone, and the great intensity of black and white. In those views of portions of Exeter Cathedral, where there are large windows at the end of the picture, the strong glaring light has spoiled the whole effect. These faults, however, are by no means prevalent in the series, we only notice them here and there. Some views, such as the "Nave, Exeter Cathedral," "The North Aisle," "The Nave and Choir from the West Door," and many others, might be named as among the best and most successful interior stereograms we have ever seen. His sea-side studies are very interesting, and give the spectator a good idea of sea-side life. "Lobster Pots," "Ladram Bay, Devon," "The Pier, Torquay," are all interesting pictures and good photographs. The slide called "Smugglers on the Look-Out," is a very clever view of just such a spot as one might imagine would be a smugglers' haunt. The panoramic view of "Torquay from the Waldon Hill," is well calculated to give an impression as to what sort of a town Torquay is.

We are very much pleased with the information which Mr. Warner has given on the back of each slide, recording the time of exposure, the season, hour of day, and the description of lens. This is a class of information that would be of great use if it were more generally adopted by photographers.

Lessons on Colouring Photographs.

THE RELATIONS AND HARMONY OF COLOURS.

IN speaking of the complementary relations of certain colours to others, it is not to be supposed that we are merely indicating the arbitrary classification of painters, or of theorists; we are explaining an absolute natural law, with which many of our readers may doubtless be familiar, and of which others may easily convince themselves by a simple experiment. If the eye be fixed steadily for a few moments on any object coloured with a pure primary colour, and then closed, an image of the object will remain upon the retina, but it will be of the complementary colour formed by a mixture of the two remaining primaries. To simplify the illustration, the familiar experiment with wafers of various colours may be tried. Take three wafers, one of each of the three primary colours; place one of them, say the red, on a piece of white paper, and look at it steadily for a short time, when it will appear to be surrounded by a narrow circle of green; or, on removing the eyes to another part of the paper, an image of the wafer, called an ocular spectrum, will appear before the eyes, but of a pale green tint, formed of a combination of the blue and yellow rays, and complementary, of course, to the red of the wafer itself. So with the remaining wafers; the blue being succeeded by an orange spectrum, and the yellow by purple; in each case the balance of colour being completed.

It is important to obtain and bear in mind a correct idea of these relations, because, on the skilful use of contrasts, much of the power of the colorist depends. Each individual colour possesses comparatively small value in itself; it is in its relation to and connection with surrounding colours that its beauty or value chiefly consists. A familiar and somewhat trite, but, at the same time, very striking illustration of this fact, is found in the comparison of painting with music. No single note possesses any musical value in itself; it is only in its relation to other notes that it possesses value; and as all the varied charms of melody arise from the succession of a few notes in happy relation, and all the sublimest harmonies depend on simultaneous combination of the same simple notes, so all that delights the eye in painting, except beauty of form, must arise out of the skilful combination, arrangement, and contrast of the three elementary colours. Again, it is important to understand fully these relations, for the simple and easy production of good effects; thus, if we would give brilliancy and power to a certain colour in the picture, it is not always necessary to intensify this colour itself to an undesirable or unnatural extent, for the same effect may be produced by bringing into juxtaposition, and degrading or lowering, its opposite; if any particular colour require warmth, the effect may be produced by cooling surrounding tints; and if transparency be required, it is obtained by contrasting with an opaque antagonist. And so in regard to many other effects, which can only be attempted, successfully, by a correct knowledge and intelligent application of these principles.

Harmonious contrasts are obtained by the juxtaposition of colours complementary to each other, and such colours are always mutually enriched by the contrast; whilst, on the other hand, colours not complementary are mutually injured by contact. Thus, yellow, and the secondary which is complementary to it, purple, both gain in richness and intensity by proximity; whilst, if purple and another of the primaries not complementary, say blue, were thus brought into contact, both colours would suffer. The same principle will, of course, apply to all neutral and semi-neutral tints, which, to give value to any more positive colour with which they may be brought into contact, should incline to the complementary of such colour; whilst, on the other hand, the intensity of any positive hue may be somewhat neutralised by an opposite course.

Contrasts, then, it will be noted, are always the most effective, as well as harmonious, when they are complementary. Even the contrast of light and shadow should be governed by this principle, for shadow will generally be not only the most effective, but the most natural, when of a hue complementary to the lights, as the familiar instance of the purple tone of the shadows during sunset, when the light is of a golden yellow, will illustrate.

It must not be imagined, however, that contrasts, however effective, and when quite complementary, are all that is necessary to harmony. Even in the monochrome of the photograph, as every photographer is aware, deep shadow and brilliant light become offensive, without the varied gradation of half tone to connect them. This necessity for gradation and connection is even more important in relation to contrasting colours; thus, orange and blue, whilst complementary to each other, and harmonious as contrasts, if used in their crude or positive state as the only colours in a picture, would be extremely unsatisfactory; but the addition of a few broken tints composed of the two, or of their elements, in varied combination, would at once give softness and harmony to the whole.

(To be continued.)

Photographic Chemistry.

CHEMICAL MANIPULATIONS—(*continued*).

Of the Treatment of Residues.—The different photographic processes that have been described in this journal are principally based on the use of the salts of silver; and more rarely gold solutions enter into the manipulations. Now, as only a very small quantity indeed goes to the formation of the picture,—probably not much more than one-twentieth of the silver contained in the solutions,—it is evident that, even when photographers only exercise the art on a small scale, it will be worth while to take care of the residues; a very easy thing to do, and one which well repays what little trouble it may give. There is very little difficulty in recovering the silver, as we shall show; and photographers residing in London may even save themselves that trouble, as a reference to our advertising columns will prove. There are two modes of treating residues, which we shall describe: one of which consists in transmuting the silver into a sulphide; and this is one of the best, inasmuch as it acts on the silver, whatever may be the nature of the solution containing it. The other process consists in converting the silver into a chloride, which cannot be done when it is contained in certain solutions,—as, for instance, in those containing cyanide of potassium, or hyposulphite of soda; which are the very solutions that are richest. There are cases, however, in which the latter process is preferable, from its simplicity. Suppose a silver bath is out of order, and the

reason why cannot easily be found and remedied, it is in such a case far better to extract the silver from it, than to waste time in what may, after all, prove futile efforts to restore it to its original condition.

The process of reducing the silver in the residues to a sulphide is thus accomplished:—

Precipitation.—Sulphide of silver is, as we have already said, insoluble in all the solutions used in photography; all that is required, therefore, is to bring the silver contained in these solutions into the condition of sulphide of silver, to enable it to be collected with facility, and afterwards to reduce it to metallic silver. The apparatus used for this operation is thus arranged:—Two wooden tubs of equal capacity are selected, and a hole bored in the side of each about one-fourth from the bottom, into which a wooden tap, like those used in brewing operations, is inserted. These vessels should be placed one above the other, in such a position that the contents of the upper vessel may be run off into the lower one. We will suppose that this is done; we now take all the residues that have accumulated, without considering whether they contain cyanide of potassium, or hyposulphite of soda, or anything else; and pour them into the upper vessel. When this is sufficiently full, a solution of *liver of sulphur* (polysulphide of potassium) should be added, the whole being well stirred during the operation: the solution should be formed of one part of liver of sulphur, to three of filtered water. The effect of adding this solution is, that a sulphide of silver is immediately precipitated, and the addition of the solution and the stirring must be continued until this ceases. If the liquid contains free acids, it will assume a milky colour, owing to the deposit of sulphur, and a strong odour of hydrosulphuric acid will be emitted: hence it is advisable that the tub containing the residues should not be kept in the laboratory.

When it is considered that the operation has been completed, the liquid is left to settle, which it will do in less than an hour, when the tap is opened and the almost clear water is allowed to flow into the lower vessel, into which a small quantity of the sulphur solution may be stirred, and then left to itself for an hour or two. In this way any silver which may escape from the upper vessel is certain to be secured in the lower one. The water is then run off, and the black precipitate at the bottom of each vessel collected, and dried on a piece of linen extended across a wooden frame, or on blotting paper, or in any other way that may be more convenient. The dry powder may then be put away until a sufficient quantity has accumulated to make it worth while to proceed to the next operation, viz., extracting the metallic silver.

Reduction.—The precipitate referred to above is formed in great part of sulphide of silver, mixed with an excess of sulphur and some water. This is placed in a crucible, without the addition of any other substance, and heated gradually to a dull red heat in a furnace. At this temperature the sulphur becomes volatilised, and will be seen to burn on the surface. When the sulphur ceases to be driven off, which will be when the flame goes out, it will be found that the substance has diminished considerably in volume, there will therefore be room to add some more of the powder, and the operation may in this way be continued, until the crucible appears about half full, when the sulphur has all been consumed. When this has been accomplished, carbonate of potash is added in the proportion of about one-third of the quantity of sulphur used, and a little borax to assist the fusion; some bits of iron (nails broken up will do) are forced down to the bottom of the crucible, care being taken that there shall be an excess of iron. The cover of the crucible is then placed in its proper position, and charcoal heaped up over it, the fire being urged for half or three-quarters of an hour, so as to keep the contents of the furnace at a bright red heat. In this time, the sulphide of silver is decomposed by the iron, a sulphide of iron is formed, and the silver is liberated and collects together in the bottom of the crucible. At the end of the time mentioned, the cover of the crucible may be removed, and the iron which has not been attacked taken out, and the remainder left to cool. When cold, the crucible may be broken, and an ingot of silver will be found.

(*To be continued.*)

Dictionary of Photography.

Background.—A frame covered with cloth, generally from six to twelve feet long, and six to eight feet high, supported by posts at the ends; movable upon the floor of the operating room, and placed behind the sitter for the purpose of giving the proper tone to the surface of the plate behind the picture. It is easily constructed of common deal boards and cotton cloth, which may be painted of any dark colour, to suit the taste of the operator; a dark Roman ochre, moleskin colour, or a blueish grey, have been found to be the best adapted to the purpose. Some operators prefer to have it painted in landscape or panelling for the purpose of improving the effect. Dr. Dorat has suggested, and used, a background, which he terms the *chromatic background*, the effect of which, upon the pictures, is very good. He describes it thus:—It consists of two wooden frames, of any size required; one of them, on feet, as usual, is covered with a light yellow canvas cloth, strained on it or not; the screen stands perpendicular upon the floor; at the lower part is attached the other frame by means of a couple of hinges, it rises at an angle of 44°; two small slips of wood secure it in this position at the upper part of the first frame; this is covered with a well-strained piece of black or brown lace; it can be procured three yards wide, and may be dyed to the requisite tint.

Baryta.—An earth, composed of one equivalent of oxygen to one of barium. It is a grey powder, procured by exposing nitrate of baryta to a red heat. It is highly alkaline—converting vegetable blues to green, and neutralising the strongest acids; it is, however, less caustic than potassa or soda, and is insoluble in pure alcohol. Like lime, it slakes when in contact with water, forming a white hydrate, which fuses at a red heat. It is slightly soluble in water.

Base.—The electro-positive ingredient of a compound or salt. Any alkaline or earthy substance, combining with an acid, forms a compound or salt, of which it is the base. Thus—soda is the base of sulphate of soda; oxide of silver is the base of nitrate of silver. It is a term most frequently applied to metallic oxides; those of the alkaline metals are the most energetic.

Basic.—A term applied to a salt in which the base is in excess of the acid.

Bath.—A term applied indiscriminately to the solutions in which photographic papers and plates are immersed, and also to the vessels in which they are poured when in use.

Benzoin.—A solid fragrant balsam. The tree which produces it is the *Styrax Benzoin*, growing in Siam, Java, and Sumatra. It is obtained by incision, and exudes in the form of a white gum, which solidifies and becomes coloured in the air. The benzoin which is used as a varnish comes from Sumatra. The first quality is called *benzoin amygdaloïde*, on account of its appearing in the form of almonds; the second quality is the common benzoin, in reddish masses, from which the former kind has been picked. Benzoin of Siam, or benzoin with a vanilla odour, is of too high a price to be used as a varnish—it is employed as a perfume.

Benzol.—The chemical product to which this name was first applied is a carbide of hydrogen, obtained by the decomposition of benzoic acid. The commercial substance known under this name is a colourless liquid; volatile, without residue; inflammable; and of a penetrating odour, but which soon disappears. It is obtained from the products of the distillation of coal, and is one of the principal ingredients of coal tar naphtha. It has been successfully applied to cleaning daguerreotype plates. It dissolves with great

facility fatty and resinous bodies, and is much used as a solvent for such bodies in the preparation of varnishes. When it is colourless, it possesses the great advantage of not resinifying like essence of turpentine.

Bibulous.—Spongy, porous; capable of readily absorbing water or moisture.

Bichloride of Mercury, or Corrosive Sublimate.—A poisonous salt, composed of one equivalent of mercury and two of chlorine. It is a white substance—crystallising in satiny needles—soluble in water and alcohol. It is volatile, without residue, by the action of heat, and this is one of the tests of its purity. Corrosive sublimate serves in photography to whiten glass positives, and to redden positive proofs which have been toned with chloride of gold.

Bichloride of Platinum.—A compound of one equivalent of platinum and two of chlorine; prepared by dissolving platinum in concentrated aqua regia, and evaporating to dryness. It forms a dark red-brown mass, and dissolves readily in water, forming a yellowish solution. It has recently been proposed to employ bichloride of platinum in toning positive prints instead of the expensive chloride of gold. Further experiments, however, are required on this point before it can be recommended as a substitute.

(To be continued.)

A Catechism of Photography.

EXCITING THE PLATE.

Q. How is the plate thus prepared rendered sensitive to the action of light?

A. By being plunged, at one stroke, into an aceto-nitrate bath, prepared in the following proportions:—

Nitrate of silver	1 ounce.
Distilled water	10 ounces.
Acetic acid	6 drachms.

A small quantity of animal charcoal is sometimes added.

Q. How long is the plate allowed to remain in the bath?

A. About one minute. After this it is removed, and a stream of water passed over it, so as to cleanse it from every particle of the bath solution. It must then be allowed to dry, and until thoroughly dry must on no account be placed in the camera.

DEVELOPMENT OF THE IMAGE.

Q. How is the picture developed?

A. By the application of the following solution:—

Water	1,000 parts.
Gallic acid	3 parts.
Pyrogallic acid	1 part.
Spirits of wine	20 parts.
Acetic acid	5 parts.

And at the time of application a very small quantity of nitrate of silver must be added.

Q. How is this solution to be applied?

A. By being poured over the plate until every part is covered.

Q. How long should the solution be allowed to remain on the plate?

A. Until the picture begins to appear.

Q. How soon will the development take place?

A. In about five minutes.

Q. What should be done when the picture begins to appear?

A. The solution should be poured off; it should then be poured on again, and this process of pouring on and off continued until the lights and shadows of the picture are fully brought out.

Q. What should be done when the picture is fully developed?

A. The solution should then be finally poured off, and the plate thoroughly washed in pure water.

Q. How long will the whole process of developing occupy?

A. From ten to twelve minutes.

FIXING THE IMAGE.

Q. When the picture is properly developed, how is it to be fixed?

A. By the application of the following solution:—

Hyposulphite of soda	2 parts.
Distilled water	16 parts.

This solution should be poured over the plate, and in a few seconds the yellow film on the surface will disappear.

Q. When the yellow film has completely disappeared, what is to be done with the plate?

A. The fixing solution must be drained off, and the surface of the plate thoroughly washed; it must then be allowed to drain and dry in an upright position.

VARNISHING THE PLATE.

Q. When the plate is dry, is it ready to receive the coat of varnish?

A. It is; and the same varnish as used in the ordinary collodion process must be employed, being applied in exactly the same manner.

MANNER OF PRESERVING THE PREPARED GLASS.

Q. In what manner are the glass plates prepared in the manner already stated to be preserved?

A. By excluding them from the light in a grooved box with an over-lapping lid.

Q. How long will plates so prepared retain their chemical activity?

A. For a fortnight or three weeks.

Q. Must they be developed immediately on being taken from the camera?

A. No; they will retain the image unimpaired for days, and may consequently be brought home to be developed.

Q. Have not some important alterations been introduced into M. Taupenot's process?

A. Yes: M. Gaumé has introduced a non-iodised collodion, which he spreads upon the glass in the ordinary manner, washes immediately in water, and confines the application of the aceto-nitrate of silver to a single immersion. M. Bayard employs a bath of gelatine.

Q. How is the gelatine bath compounded?

A. In the following proportions:—

Filtered water	1,000 parts.
Pure gelatine	25 parts.

As soon as the gelatine is dissolved, add—

Iodide of potassium	200 grains.
Bromide of potassium	48 grains.

Filter through a piece of fine linen.

Q. What description of collodion is applied?

A. A non-iodised collodion, the solution consisting of ether, gun cotton, and spirits of wine.

Q. How is the image developed?

A. By the application of the solution used in the ordinary process.

(To be continued.)

Correspondence.

PRINTING IN CARBON.

Sir,—More than once have you adverted to the sensation created in the photographic world by the carbon process of Mr. Pouncey. I believe, in every journal devoted to the science, and in many not so, has the mode of manipulation been published, and yet, strange to say, scarcely a correspondent has alluded to the subject. This I can only account for in two ways:—The notices and specimens of this process have not been alluring enough to tempt experimentalists; or, the extreme nullity of the result has caused a reserve in publicity.

Induced by the reputed permanence of the prints, I attempted, some time since, to obtain a few pictures by this method; and, I will own, I was sanguine enough to entertain

ideas of "out-pounceying Pouncey," and producing representations of nature "for perfect delineation, depth of tone, and middle tint, surpassing," &c. &c.

Some pardonable anticipations were indulged, as with polished marble slabs and a few drachms of the "liquid dust," the preparatory grinding commenced.

The effect of the first half hour's labour, I was prone to consider, was as palpable in the arm-joints as elsewhere, and this may possibly, at the expiration of an hour, have facilitated my comprehension of the fact, that there *is* a "limit to mechanical diversion." At any rate, I commenced the admixture of the gum, bichromate, and carbon; being careful to adhere scrupulously to the authorised description, that is, where the boundaries are discoverable. Preparing the paper, coating and allowing for absorption, the "hog's-hair softener" was next called into requisition, and after a deal of "horizontal and vertical" brushing, some half-dozen papers were prepared with a tolerably smooth surface. These when dry were exposed,—the first, the maximum advised; the second, the minimum; the third, one half the latter; the fourth, some 30 or 40 seconds, and the remainder hap-hazard. They were then consigned to the troughs. At the end of twelve hours they were examined, and my expectations fell suddenly to zero, as I discovered that the least exposed of the batch showed no symptoms of precipitated carbon.

Well, Sir, to be brief, I have since tried solutions of gum of nearly every degree of fluidity from that of oil to water,—have used the bichromate in many proportions, brushed and omitted brushing the paper, and read the rules backward (in hopes of information), but still *the carbon won't fall.*

That there exists some latent cause for these failures, I cannot doubt, nor do I censure the process for my individual results; but I would remark that a method requiring such extreme vigilance and care to produce any picture at all, must not be expected to supersede (as some aver) the argentine practice, in which the amateur's first print is often as fine as the negative will produce.

I have been more successful with the modification of the Ink process, communicated in a late number of the "Photographic News." The principal drawback is the slaty hue of the lights; and this difficulty I find insuperable, as, although reduced by a more sparing use of gelatine, it is at the expense of the sharpness.

Allow me, in conclusion, to thank "One of Devon" for the admirable intensifier given in his communication at p. 130. It is the best I have ever met with. I think, however, some of your readers will find the solution of iodine there recommended of insufficient strength if the picture be old. In one instance, where the positive had been varnished with arabic (this subsequently re-dissolved), the undiluted tincture alone proved effective.

Euphos.

Sheepscombe.

THE PHOTOGRAPHIC SOCIETY.

Sir,—In justice to the gentleman, whoever he may be, who wrote the report published in your journal of what took place at our last meeting, I cannot refrain from offering you my testimony as to the fair, full, and impartial manner in which he performed the task. I say, in justice to that gentleman, because all of us who are furnished with an official report of what passes, and who are unable to be present at the meetings, as comparatively few of us are, may, on reading that report, imagine that he has stated many things which never took place, simply because they are not contained in the official report.

I do not hesitate to characterise the official report as a garbled and inaccurate one. The complaint of Mr. Malone as to the slovenly and inaccurate manner in which the reports are published, as well as that of Mr. Hughes, are carefully suppressed, as are also sundry complaints of the manner in which the affairs of the Society are managed.

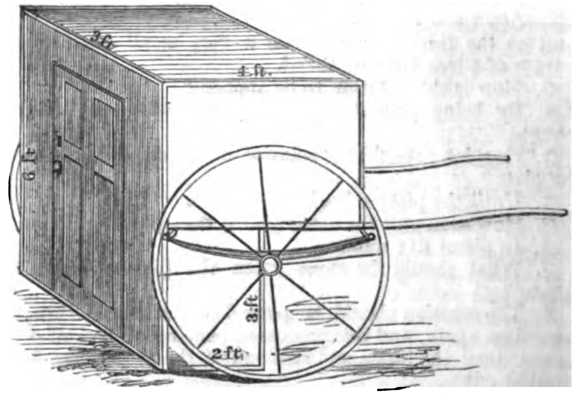
If my memory serves me—and you will correct me if I am wrong—it was stated by the council, a few months back, that in future the official organ would have no recognised editor, and, judging by the report before me, it really has none. It reads as if a compositor had been intrusted with condensing it, and that the editing had been done by the printer's devil. To cite one particularly glaring blunder. The President in his address referred to M. Niepce de St. Victor as "the celebrated foreigner who had made the remarkable discovery of a method of storing-up light." The printer's devil, or somebody else, fearing that we might not know the name of the celebrated foreigner referred to, took upon himself to try to enlighten us upon this point, and appended a foot-note stating—what? why, that this celebrated foreigner was named *Victor St. Niepce!* Such an utterly absurd jumble of a man's name I never before met with; and the ignorance displayed by the writer will be the more offensive to our foreign brethren in the art, from the fact that the distinguished individual meant is an honorary member of the Society.

In conclusion, I may observe that if we are to be snubbed when we offer remarks at our meetings on the management of our own Society, and our just complaints to be concealed from our absent fellow-members, the Society is worse than useless for carrying out the objects for which it was originated, inasmuch as it is in the position of the dog in the manger, it will not carry out those objects itself, and at the same time stands in the way of the formation of another society which *would* accomplish them. The real fact is, that only a comparatively small number of members are present at any meeting, while the council is represented in an overwhelming proportion; and, as in all such bodies there is certain to be a number of men who are influenced by the "snobbish" feeling which leads them to do as any man of mark among them does without question, no independent member has the slightest chance of carrying any amendment in opposition to the wishes of the council. As an example, the council have expressed an intention of entering into a law-suit, which may end no one knows when or how, very likely in our being defeated; yet the opinion expressed by one of the members that, before entering into such an important matter, the council ought to have consulted the whole body of the members, was pooh-poohed.—I am, sir, your obedient servant,

A Member of the Society.

THE PHOTOGRAPHIC BARROW.

Sir,—In these days of steam and progress, everything that does not partake of the "spirit of the age," or a locomotive tendency, is sure to be distanced by a *faster* rival; and, with this conviction, some months ago I contrived a photographic barrow, a drawing of which is annexed.



Simplicity of construction, cheapness, and extreme comfort, are its great recommendations; and its mode of *propulsion*, or *traction*, is perfectly at the option of the photographer. If of a self-reliant and independent spirit, he would doubtless prefer "pushing his case" before him through the world;

or, if more inclined to indulge in the *dolce far niente*, he can attach to the shafts a pony of Jerusalem, and slowly drive along through many a pleasant way of "merrie England." The barrow in question is an exceedingly light and simple affair, consisting of a slight but strong framework of wood, covered with American cloth; and balanced upon springs attached to an axle, on the arms of which two nicely made, but extremely light, wheels rotate; the addition of shafts completes the concern. We have then a perfectly *light-tight* chamber, of the following dimensions, to manipulate in:—

Height	6 feet.
Width	3 "
Breadth at top	4 "
Breadth at bottom	2 "

The aforesaid chamber is entered by a door, situated behind, and lighted by an orange-coloured glass pane in front, immediately above the operating bench (3 feet wide and 2 broad). Ventilation is duly provided for by means of blinded apertures at top and bottom—thus securing that coolness and serenity so necessary to successful manipulation. When about to operate, two struts are lowered from the shafts, and two from the posterior angles of the chamber, which immediately render the vehicle perfectly stable, and the manipulator may safely tread the floor of his chamber without fear of what seamen designate as a "capsize." Ample space is provided for apparatus, &c., and for that photographic essential—abundance of water. Trusting that the accompanying sketch may render the construction and utility of the barrow patent to all,—I am, sir, yours obediently, THOMAS W. HOWARD.

Photographic Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A MEETING of the above Society was held at the Literary and Philosophical Society's Rooms, on Wednesday evening, the 2nd instant, Mr. Parry in the chair.

The Chairman called the attention of the meeting to the subject of the Stereoscopic Magazine which was intended to be published by the Society and distributed to the members, and invited members to send to the Council as early as possible copies of stereoscopic pictures, from which a selection would be made for the Journal.

The Secretary, Mr. E. Mann, stated that Mr. J. L. Davies had presented four photographs to the Society's portfolio; these were handed round, and much admired for their tone and sharpness. Upon the suggestion of the Chairman a vote of thanks was passed to Mr. Davies for his present. Mr. A. Brothers presented a print taken by him two years ago. Its interest consisted in the colour being retained, although it had not undergone the usual process of washing, having been only once rapidly passed through water at the time it was taken, while others printed at the same time and well washed had faded.

Mr. Sidebotham read a letter received by him from Mr. Shadbolt, respecting the subject of developing by daylight, which Mr. Shadbolt stated he considered to be of great importance, and expressing a wish that the members of the Society would communicate to him further information as to the results of their experiments.

Mr. Dorrington explained the satisfactory results of his experiments on the raspberry syrup process. The only difficulty he had to contend with was, the extreme tenderness of the film, but he was glad to say that he had now discovered a method by which this could be entirely overcome; he said that he and Mr. Neville had made numerous experiments relative to coating the glass with dilute albumen and other substances, previous to the application of the collodion, and he had at last discovered a plan which was everything that could be desired, rendering the film so firm upon the glass that it would bear any amount of washing without injury: even a waterspout would not remove it. He also thought it would entirely prevent the possibility of blisters in the collodio-albumen process.

This plan was, to coat the plate with a solution of gelatine in alcohol, and when dry apply the collodion in the usual way; the solution of gelatine in alcohol he used was the same as that recommended by Dr. Hill Norris, the formula of which is given in the number of the "Journal of the Photographic Society," of the 22nd December, 1856, page 179, and used by Dr. Hill Norris for coating his dry collodion plates; but Mr. Dorrington thought it more advantageous to use about one half the quantity of gelatine.

Mr. Sidebotham said he thought Mr. Dorrington's discovery very important; he had tried it with a collodio-albumen plate, and had found it impossible to get blisters. He had also rubbed the glass with his finger previously to the application of the gelatine, and had not been able to observe any trace of the same on developing; he, therefore, thought this plan would obviate the necessity of cleaning the glasses so carefully. A general discussion took place upon the subject; the members arguing that Mr. Dorrington's plan would be exceedingly valuable for all processes. A number of stereoscopic prints on glass, taken by Mr. Dorrington with the raspberry syrup process, the plates being previously treated with the gelatine solution, were exhibited to the members, and were considered very beautiful, being particularly bright and clear. A vote of thanks was passed to Mr. Dorrington for his valuable communication.

Miscellaneous.

AUTOGRAPHY OF THE STRATIFICATIONS OF ELECTRIC LIGHT, BY M. CHARLES MORREN (being a letter addressed by him to the President of the Paris Institute).—"Allow me to inform you of certain facts which I met with while carrying on the researches, which have occupied my attention for some time past, on the electric light, on the stratification it presents not only in rarefied gases, but in gases submitted to increasing pressures from the $\frac{1}{100}$th of an inch of mercury up to several atmospheric pressures. I sought for the means of compelling the electricity to trace, and so to speak, to autograph for itself, the stratifications, upon which the nature of the ponderable matter necessary to the passage of the electricity has a great influence. Having had consequently occasion to vary both the nature of the gas submitted to the spark, and especially the nature of the electrode, I have obtained several combinations worthy of remark: thus, in a tube where the spark of the induction apparatus was produced between wires of platinum, I caused to pass a suitable mixture of hydrogen and nitrogen, by means of two mercury gasometers. Ammonia was directly produced, and absorbed as it was formed by a standard solution of sulphuric acid and water. The gaseous mixture thus always remained in conditions favourable to combination. Two bands of litmus paper reddened by an acid were restored to a blue in less than a minute. In my first experiment I thus formed thirteen cubic centimètres of ammonia. By taking charcoal electrodes and causing the hydrogen to circulate, I obtained a carburetted hydrogen, of which I have not as yet fully ascertained the nature. I am engaged at this moment on the subject of cyanogen, of which I have already verified the formation. The electric current thus presents the one particle to the other in a nascent state, or in the *ozonised state* favourable to their combination. The apparatus I now possess enables me to continue these experiments with ease." A second letter was addressed by the same gentleman to the Abbé Moigno, the able editor of *Cosmos*, which was as follows:—"I take the liberty of forwarding you a copy of a letter that I sent to the President of the *Académie des Sciences*, through M. Dumas, to inform him of some results which seemed to me deserving of interest. You will see in it the indication of the experiments, which, for a long time past, have engaged my attention, and of which you have already been kind enough to make mention in your journal, on the occasion of a communication made by M. l'Abbé Gras, of Marseilles. The question of the stratification of electricity has attracted the attention of many eminent physicists; and you have published Mr. Grove's views with respect to this matter. I do not share the opinion which attributes this phenomenon to the intermitting induction. Now, when we differ in opinion with a person who is such an authority as Mr. Grove, it is necessary, in our experiments, to look closely into them with greater attention, and to repeat them more than once. I attribute the stratification to a variation in the intensity of the tension of the circulating

electricity, but especially to the insufficiency of the gaseous conducting body, through which the current passes. I believe that the stratification is a general phenomenon; the smallest spark is stratified, whatever may be the pressure of the gas, or of the medium in which it is produced. The nature and density of the medium traversed have an enormous influence in rendering the stratification more or less visible. Thus, in hydrogen, it is always very beautiful and very apparent, and this circumstance furnishes another proof of the metallicity of this gas. It conducts relatively the electricity very much, by comparison with the other gases. The carbon, in gases, and in the vapours in which it enters, communicates this same property, by reason in fact of its conducting power. The essences, alcohol, and bisulphide of carbon, give the proof of this. Besides, to make my opinion more clear to you, permit me to point out to you an experiment with which you are familiar. If a powerful discharge of static electricity be made to pass through a sufficiently fine thread of metal (platinum, silver, or gold, &c.), this opposing a too considerable resistance, lateral discharges are directly produced, which reduces the metal to a vapour and a very fine powder, and driving it, by reason of the polarised air, towards the neighbouring bodies. If a sheet of paper, or better, a cylinder of paper, is suitably placed above or around the thread, the lateral discharge may thus imprint on the paper the stratifications of the electricity. If even the thread be too thick to be broken and reduced to powder, the passage of the discharge suffices to detach and throw to a distance, either the light powders, or the layer of oxide which may coat the metal, if it is oxidisable. A copper chain placed on a sheet of paper or a porcelain tablet, thus admirably designs its imprint, even with a feeble discharge. The specimens enclosed herewith, made with a very slight spark, will furnish you with the proof of this. If the pressure of the gas in which the spark passes is augmented (I have carried it to three or four atmospheres), the stratifications approach so closely as to touch. They separate, on the contrary, if the pressure is diminished. Finally, when the gas is sufficiently rarefied to conduct the electricity, the electric fluid passes well along the thread, but neither volatilises it nor melts it, because the electricity finds a passage in each file of the gaseous particles, which then appear gifted with a considerable facility of polarisation. There is at the same time a passage from one conductor to another, with multiplied sparks, through the polarised gaseous medium, then induction and lateral discharges towards the neighbouring conducting bodies, and it is in that which consists the phenomenon of the stratification. When the pressure of the gas is great, the spark is so extremely vivid that the dazzled eye cannot perceive the stratification, the imprinted design alone reveals it. An appropriate diaphragm would enable it to be seized in its passage. The nature of the gas has more influence on the stratification than the metal has, and the aspect and details of the stratification are singularly modified by the form of the vessel which contains the gas. The mode of egress of the electrodes is, for light, entirely different, and its study leads to the explanation of the metallic volatilisation which, in Geissler's and M. Plucker's tubes, takes place at only one of the poles. But I have already extended my letter to a much greater length than I ought to have done. Pray excuse me, and receive the expression of my respect."

Photographic Notes and Queries.

HOW TO TREAT SILVER RESIDUES.

Sir,—Your kindness in replying to a former inquiry induces me to trouble you again.

I have a quantity of old hypo. toning bath in which I have fixed some scores of prints, and it has in consequence become, by use, quite a red-brown colour. It throws down a considerable deposit, of dark colour, after standing in the dishes for a few days, or after fixing any prints in it. I have been in the habit of filtering it, and adding gold and hypo. to it, and have always been able to get it to work again. I take the prints direct from the press (first cutting off the superfluous edges), and immerse at once in the fixing bath, and from first to last I should think there must have been added at least twenty shillings worth of gold. I see some say—throw away old toning baths; but I throw away nothing, and will (if not trespassing on your space) give you, at the end of this letter, a simple and effective way of recovering silver from old paper cuttings, to the value of which I can testify, as I have three nuggets of silver, each exceeding one ounce, produced from them. My object is now to inquire of you if you can give me a good method by which I can recover the gold and silver, of which I am sure there must be a quantity, from this old toning bath of mine (about six pints); as I have lately found it does not revive so effectually as formerly, and would rather make up a fresh one to begin printing with in the spring.

Also, what is the nature of the black, or, rather, brown-black deposit?* Is it blackened chloride of silver, accumulated by fixing the proofs without first washing off the free nitrate? Is it sulphate or sulphite of silver, produced by the decomposition of a portion of the hypo.? Is it an oxide of silver, or is it gold, or do each or part of these enter into its composition?

These are, I admit, very lengthy inquiries; and as I am already in your debt, I beg to tender my very sincere thanks for last week's favour, to "Not up to the Mark," and remain, yours obediently, One who Tries.

P.S.—If worth the space of an insertion, the following is a thoroughly practical and easy method to reduce all kinds of silver residues to the metallic state. I save the residues of everything in which silver has been used at all, as follows: the cuttings of paper off the edges of prints before toning (this also saves a good deal of gold); the cuttings after fixing or mounting; all the filter papers, kaolin, &c., used to decolor the printing bath. I keep a dish with a lot of salt in it, and into it pour the washing of all bottles, baths, &c., and which of course saves every atom of silver present. I also develop glass positives over a dish having a hole and pipe in it, which carries off the developing solution, and with it a quantity of reduced silver to the bottom of a cistern underneath, from the top of which the excess of water flows by a pipe into the sink, leaving the silver at the bottom.

About once a month I have a burning match on a dull day. I burn all the clippings, filters, &c., collect on a filter all the chloride of silver from the dish of salt (first washing to be rid of excess of salt), also all the deposit from the developing cistern, burn these filters also, and carefully preserve all the ashes. I now take a large mortar, and having placed in it carbonate of soda, add to it nitrate of potass and grind together, adding the ashes a little at a time, till all are thoroughly incorporated. I then place it in a Stourbridge clay pot, and take it to a blacksmith's forge (it is never half performed in a common fire, blow how you will); well surround the pot with cinders (not wet coals), and blow up steadily. I find it melts more readily than brass; however, when you see the flux in a boil, and by stirring it with a piece of wood cannot get up any lumps not in a state of fusion, take a pair of tongs and warm them slightly, or ten to one the pot will fly; lift the pot from the fire, shake it well, and, with a piece of wood, remove as much of the flux as possible, return the pot to the fire and get it once more hot, and if, on turning aside, the silver will not present itself without some of the flux, take off as much more as possible, and, by shaking, the silver will run in a little button on a dish of sand quite free.

The best way to make nitrate of it is to have another pot kept on purpose, and remelt the silver and pour it into a bucket of cold water, which will granulate it, and separate particles of sand which adhered before. This method prevents the necessity of breaking a new pot every time; also, by using the same pot again, if any silver remains in the last portion of the flux, it is obtained the next time there is any to melt.

[The subject of treating and reducing silver residues has been so fully gone into in our Chemistry, that further expla-

* It is apparently of quite a different nature to the scaly deposit sometimes formed on the glass bottle after standing some time, and which may be rubbed off in flakes, but which immediately fall to the bottom.

nation is hardly needed. If our correspondent precipitates his old hypo. bath with liver of sulphur, and then obtains the silver from the sulphide in the form of a fused lump, the gold will be all contained in it, and will be left undissolved on treating the metal with nitric acid. The black substance deposited by the old fixing bath is sulphide of silver, Ag S, with, perhaps, a trace of sulphide of gold, Au S_3. ED.]

ALBUMEN PROCESS ON COLLODION.

SIR,—I have been re-perusing your excellent paper on "The Albumen Process on Collodion," which you published in June, 1857, where you adopt the modification of Taupenot's process introduced by M. Gaumé. With this exception, I do not perceive much difference between your process and that of Mr. Sidebotham, in p. 170 of the "PHOTOGRAPHIC NEWS;" but the exception is so important that I should be glad to know from Mr. Sidebotham or yourself whether experience is in favour of the employment of iodised or uniodised collodion?

There is another point in the collodio-albumen process, which appears to me important. Dr. Riley, of Islington, who has practised this process with great success, has recently drawn attention to the importance of washing off the coating of albumen, in the same way as in Fothergill's process. This, he contends, not only renders the plates so prepared more sensitive, but, as a necessary consequence, lessens the time of exposure and of development. I am informed that the only drawback to washing the albumen off the plates is that they will not keep so long. I have, however, seen some excellent negatives taken by this process, the plates having all been well washed after being coated with albumen, as recommended by Dr. Riley. AN AMATEUR.

NOTES ON COLOURING PHOTOGRAPHS.

SIR,—Some twenty-five years ago I took lessons from one of the best miniature painters of the day. One thing I learnt, it may be worth your while to incorporate with your lessons on colouring photographs. I have tried the method upon some of the prints which I amuse myself sometimes by painting, and find it of great assistance; and glad shall I be to add a mite to the immense stock of information and amusement to be found in your "NEWS."

Before I commence with colour, I size the print, and mount it on good thin Bristol board. After the painting of the photograph has been well advanced, I hold the print up to the light, with the back towards myself, and with a pencil outline the face, neck, and hands. I have a clean and highly burnished copper plate, and a small polished castor, fixed into a handle. I lay the photograph, face downwards, on the burnished side of the copper plate, and with the castor go over, with a very heavy pressure, the spaces included in the pencilled outlines. This gives a better surface than any other plan with which I am acquainted; and the painting may now be proceeded with, and the portrait worked up, as highly as any miniature on ivory.

Gateshead. D.

SUGGESTIONS FOR IMPROVING THE STEREOSCOPIC CAMERA.

SIR,—Will you allow me to suggest to camera manufacturers, through your valuable "NEWS," that they should contrive a stereoscopic box camera, so that it could be used with *two* lenses to take both pictures at the same time, or with *one* lens in the ordinary way at pleasure. I presume this could be easily done by mounting a *twin* lens camera upon Latymer Clark's parallel bars, with some means of shutting off one camera entirely, when needed; the advantage being that, in taking a view of distant objects, a wide separation of the pictures could be made without trouble.

The contrivance I mean need not be expensive,—indeed an ordinary *twin lens* camera *upon bars* would do, as keeping the cap on one lens would shut off the light, and the picture could then be taken *through one lens only*, as in a single camera, provided the back were made to admit of the slide being moved. J. W. W.

GELATINE PAPER.

SIR,—I think there are only one or two places in London where the "gelatine paper" can be procured. I inclose you a specimen, which is very clear and transparent; the thicker kinds are not, I think, clear enough. I fancy the objection to using the gelatine paper, as a vehicle for the collodion film, would be, that it is not near so even a surface as glass. I have not myself tried it, as I prefer transferring the film; but, by placing a piece on glass by gumming just round the edge of the glass, the collodion might easily be applied, and as it makes the gelatine paper water-proof, it might be dipped in the sensitising bath. The least water, however, that touches it spoils its flatness, and makes it wrinkle up.

Reigate. T. BARRETT.

REMEDY FOR OVER-EXPOSURE IN THE COLLODIO-ALBUMEN PROCESS.

DEAR SIR,—Your correspondent, M. P. M., at p. 251 of the "PHOTOGRAPHIC NEWS" asks, "how an over-exposed negative can be made a good one?" The following plan is at his service, and will be found to answer the purpose:—

When the picture is found to be over-exposed, stop the development as soon as the picture is well out; wash, and clear from the iodide of silver, and again wash. Then redevelop with pyro. and silver, which will produce *intensity* in the requisite degree and proportion. I am presuming, of course, that the picture has not been *very much* over-exposed, but only in that degree which, with ordinary treatment, would produce a flat, over-done negative.

J. SIDEBOTHAM.

OLD COLLODION FOR CLEANING PLATES.

SIR,—Much has been said about using old collodion for cleaning glass plates. I tried the plan the other day; I found the results to be perfectly satisfactory, as far as producing a clean plate went; but I would tell my brother photographers that I found it most injurious to the eyes ere I had cleaned a dozen, and shall never be induced to try it again for the mere sake of using up the old collodion.

E. PEPPER.

SYNOPSIS OF PHOTOGRAPHIC PROCESSES.—PRINTING ALBUMENISED PAPER POSITIVES.

Float paper on exciting bath 3′ to 5′.
Hang up to drain.
Blot off.
Expose in frame.
Wash in water till no milkiness remains.
Immerse in toning bath 10′ to 15′.
Wash 4 to 5 hours in running water; then in boiling water.
Blot off and dry.

Exciting bath:—

Nitrate of silver	60 grains.
Glacial acetic acid...	¼ minim.
Water	1 ounce.

Toning bath:—

Chloride of gold	1 grain $= a$.
Nitrate of silver	4 grains $= b$.
Hypo. soda...	1 ounce $= c$.
Water	2 ounces $= d$.

Dissolve c in $\frac{d}{3} = x$.

" a in $\frac{2d}{3} = y$.

" b in $\frac{d}{3} = z$.

Pour y into x, and z into the mixture.

H. S. I.

WHAT TO AVOID IN PHOTOGRAPHY.

Do not allow the nitrate bath to remain longer than necessary in a gutta percha vessel.

Do not add water or any aqueous solution to collodion.

Do not be always trying new processes before you have mastered one.

Do not be sparing of collodion when pouring it on.

Do not put down the stopper of a bottle until you are certain that it will lie in a clean place.

Do not attempt to print from a negative until it has been varnished at least two hours.

Do not use complicated formulæ until you are certain that equally good results cannot be obtained with more simple means.

Do not allow the hyposulphite bath for fixing paper positives to become old or acid.

ANSWERS TO MINOR QUERIES.

Quantities of Materials necessary for a Beginner to Start with.—*G. N. Dunn.* Our correspondent writes,—"There is one matter which, though he has looked well through all the pages of the 'Photographic News' up to the present time, he has not perceived that we have given beginners any well-defined idea about, and that is, the various chemicals used in the art, and the probable quantity of each that it would be well or prudent for them to order at first." We give the following, as containing what we consider the necessaries only, and in sufficient quantity to last for about 100 small sized pictures (4 × 5). Three ounces of crystallised nitrate of silver; half a pint of collodion; a quarter of an ounce of pyrogallic acid; four ounces of glacial acetic acid; half a pound of hyposulphite of soda; four ounces of alcohol; four ounces of good spirit varnish; three ounces of salt and tripoli plate-cleaning liquid. In addition to these, there will be required an apparatus; a camera, with slides, lens, stand, &c. complete; glass plates in boxes; gutta-percha bath and glass dipper; levelling stand; gutta-percha dish for developing over; one or two funnels; box of scales and weights; a one-ounce glass measure graduated into drachms; a few stoppered bottles of different sizes, from one ounce to one pint. One quire of best white filtering paper; yellow calico, paper, or glass, for admitting light into the dark room.

Preparation of Iodide of Cadmium.—*Churk.* To prepare this salt for photographic purposes, take 7 parts of metallic cadmium in coarse filings, and 3 parts of pure iodine. Place them in a flask together with sufficient spirits of wine to cover them well. Action will immediately commence, and the liquid will become very hot and perhaps boil. Add more alcohol as it evaporates; and as soon as the combination is complete, which will be known by the iodine having all disappeared, leaving a few grains of cadmium at the bottom of the flask, add more alcohol to dissolve any iodine of cadmium which may have crystallised out, and filter into an evaporating basin. Evaporate at a gentle heat, and the iodide of cadmium will crystallise out in the form of white nacreous plates. If the colour happens to be rather yellow, it will be removed by a second crystallisation. On the large scale the alcohol may be economically replaced by water, but for amateurs we recommend the employment of alcohol.

Colouring Scarlet Uniforms.—*R. W.* A very brilliant scarlet for a soldier's uniform may be produced by good colours on a good positive, if a little care and pains be given to the colouring. Use, as you say you have done, an alabastrine photograph, and varnish with the alabastrine varnish, colouring and varnishing alternately two or three times, if necessary, to obtain brilliance in colour. Then, finally apply a good coating of the scarlet, and varnish with the "penetrating varnish" advertised in our first page. You will by this means obtain a coloured non-inverted picture, with a brilliant scarlet viewed from either side. We have seen very excellent results produced by this method. With imperfect colours you will, however, only obtain something of a dull brick colour.

Gelatine Paper.—In answer to numerous inquiries we are enabled to inform our readers that this article will be shortly brought before the photographic world; arrangements being made for its supply in large quantities, and at a reasonable price. Our advertising columns will shortly contain full particulars.

TO CORRESPONDENTS.

Mr. Grubb's Patent Aplanatic Lenses.—*The agency for the above lenses has been transferred to Mr. E. Sutton, 204, Regent-street, W., who will in future attend to all orders connected with them.*

☞ Some complaints having been made by our subscribers as to the non receipt of the "Photographic News," the publishers beg respectfully to notify that every care is taken on their part to insure punctual and correct dispatch. All complaints should, therefore, be made to the Post Office authorities.

We must beg our correspondents not to send glass plates through the post, except they are securely protected against breakage.

T. L. G.—We do not recommend the addition of glycyrrhizine, or other organic matter, to collodion. It may temporarily improve a bad article, but will be almost certain to injure a good collodion.

M. Henry.—A very excellent method of transferring glass positives to glazed cloth, has been already published in the "Photographic News."

J. McL.—Attended to.

A Constant Reader.—1. It would answer very well. 2. It would require an *erecting eyepiece* to be used; a description of this would hardly be appropriate in the pages of the "Photographic News," but will be found in any work on optical instruments. 3. We are sorry we cannot help you.

W. B. N.—In speaking of so many *parts* of a substance in formulæ, it is understood that ounces, drachms, and grains *by weight*, are equal to fluid ounces, drachms, and minims *by measure.*

Bungip.—1. Your contrivance is ingenious, but not so good as some in general use. 2. The bath is pretty good—not quite so easy to manage as the one at p. 86. Always wash before toning or fixing. 3. It would not be likely to answer.

S. T.—Writes as follows:—"I shall be greatly obliged if you can inform me if there are any departments of the public service—naval, military, or otherwise—where appointments as 'Photographer' are made. Photography is systematically taught at Addiscombe—Is there any staff, or person specially retained for that purpose? The Royal Engineers are, I believe, 'self-sustained,' employing non-commissioned officers for that purpose, but with very uncertain results. Are there any retained at the various observatories? In short, can you tell me if there is any way in which one who has spent much money in making himself an efficient photographer can practise the art profitably without 'taking likenesses?' I possess *interest*, but little capital."—We think there are such openings for able scientific photographers; but we know of no particular appointments at present.

H. T. T.—Received with thanks.

A Subscriber.—The position for the diaphragm, in your case, may be *in front* of the lens (single), and as far off as possible without darkening the corners of the picture. For a portrait lens, place the diaphragm close to the front lens.

Chloride.—1. You should have added acetic instead of nitric acid to your bath. Now, we fear, you can do nothing but make a new one. 2. Perhaps the free nitrate of silver has drained away from that part of the plate too much. 3. Not very well. 4. A ¼-plate portrait lens, fitted to a lateral sliding front, will answer for stereoscopic pictures.

Triptolemus Curmudgeon.—1 and 2. We prefer the collodio-albumen process 3. See p. 86.

A Beginner.—A ball and socket movement on the camera-stand is very bad; as it is impossible with it to get sufficient steadiness. The height should be, so that the lens of the camera is on a level with the eye. 2. You must inquire at a shop where such things are sold. 3. Not easily.

Integer vitæ scelerisque puris.—1 and 2. Yes; if properly stopped down, but not so well as a single lens. 3. The aplanatic lens. 4. We never heard of the lens you mention. 5. We have seen some very good pictures taken by its means.

Hyposulphite.—Answered in the present number.

Mr. D. C.—Gelatine paper will shortly be advertised in our columns. We have never seen the ambrotype muslin.

Φῶς.—Cyanide of potassium will eradicate silver stains from articles of clothing; and if applied carefully, and well washed out immediately afterwards, it will not injure the most delicate fabric.

A Constant Reader.—Alabastrine photographs ought not to fade; see a query and explanation in a former number.

J. T. D.—Your arrangement is not so good as many which are in common use.

A. C. S.—The shorter the focus, the less range required to take pictures of a small size. 2. The colour you send would do for some purposes; but different coloured backgrounds are required to get the best effects. 3. They are over-exposed.

W. Phillips.—We think the cause must be owing to the silver having been too much washed off the plate before coating with albumen.

Soldier.—See answer to G. N. Dunn in this number.

Churk.—We believe the so-called crystal varnish, is a solution of gum benzoin in benzol.

An Amateur.—1. We prefer a twin-lens stereoscopic camera. 2. See the letter on the subject in our last number.

A. M.—Instantaneous photography is the most difficult branch of the art, and can only be successfully accomplished by those who have acquired great experience in manipulation. Of course all the materials must be of the best, and in perfect order.

H. P. D.—Try the government signal light; and burn it loose.

Communications declined with thanks:—J. Edward.—Amber.—F. A. X.—Hypo.—J. O. L.—M. M. M.—No. 3.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—Paper.—R. T. N.—A Struggler.—Anti-H.—Printing Ink.—L. O. P.—S. E. L.—F. I. T. S.—A Correspondent.—Astro.—Φωτός.—C. D. H.—Emmet.—A Painter (No).

In Type:—Churk.—Paper.—A Subscriber.—Viator.—H.F.—M. D.—W. R. S.—X.—G. E.—J. S.—An *Ex*-Member of the Council.—J. C. T.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Cassell, Petter, and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., NO. 24.—*February* 18, 1859.

OCULAR DEMONSTRATION OF M. NIÈPCE'S DISCOVERY WITH RESPECT TO LIGHT.

WE have great pleasure in publishing the following interesting article from the pen of the Abbé Moigno:—

"The London Photographic Society has recently held its annual meeting under the presidency of the Lord Chief Baron, Sir F. Pollock, who is, at the same time, a member of the Royal Society. In the address delivered by the President, we remark the following passage:—'I regret to have to inform you that the hopes I gave you last year have not been realised, and that the experiments of M. Nièpce de St. Victor have not been repeated with success by any English experimentalist. I have heard that Mr. Hardwich and several others have tried the experiment and failed. . . .'

"On the other hand, Mr. Hardwich, who, as is well known, has repeated the experiments, has passed them over in utter silence in the new edition of his *Manual of Photographic Chemistry*, and, that he may not be reproached with this, he has taken care to say in his preface:—'Those who read the proceedings of the French Photographic Society will expect to find here a *résumé* of M. Nièpce's researches on a new action of light; but the author, after a careful comparison of the results with those previously obtained by Moser and other experimenters, has decided to leave the subject for further investigation.'

"From these facts, and many others that we might quote, it follows that, in England, the splendid experiment, we will say more, the grand discovery, of M. Nièpce de St. Victor is as if it had never been made. He is believed to be the victim of an unfortunate illusion. In this state of things they will be grateful to us if we relate what took place in the laboratory which M. Nièpce has contrived in the Louvre. Our friend wished Professor Wheatstone to see with his own eyes the curious experiment of his tube, or of a photograph made by light which had been stored up for several months. Mr. Wheatstone, the illustrious physicist, very willingly accepted the invitation. M. Nièpce took a tube containing a piece of pasteboard which had been impregnated with tartaric acid, insolated for a length of time, and rolled up in it, in the month of June last, and the tube then hermetically closed. He and Professor Wheatstone placed themselves in a dark room; M. Nièpce had a sheet of sensitised paper, on which he placed a piece of paper printed upon in large letters; he then opened the tube, holding it vertically, with the orifice downwards, and this orifice he placed on the printed paper which covered the sensitive paper; the tube was left in this position for about ten minutes, at the end of which time he removed it. The circle on the paper blackening in all its parts where it was not protected by the printed letters, at once visibly manifested the action of the light; the printed paper being removed, the characters were found to be very neatly traced in white, or forming a negative proof; this negative was treated like ordinary negatives, that is to say, it was fixed, and Professor Wheatstone placed it in his portfolio, to produce it before the Royal and Photographic Societies; a proof obtained by means of light that had been imprisoned for six months. The experiment, therefore, succeeded perfectly. Professor Wheatstone takes with him two tubes, one of which was placed in our hands on the 7th February, 1858, more than a year ago, the other closed in the month of June last, like that which was so efficacious under his inspection, and he will himself repeat the experiment in London before his illustrious colleagues, who will not then retain even the shadow of a doubt as to the reality of the persistent activity of the light.

"In short, every one may succeed whenever he wishes if he operates in the following manner:—Take a very white piece of pasteboard, steep it a sufficient time in tartaric acid, or in nitrate of uranium; the tartaric acid succeeds best and is more certain; expose the pasteboard to the direct light of the sun; leave it to saturate itself with light; you may conclude that this saturation is sufficient when a drop of nitrate of silver blackens instantaneously on contact with the pasteboard; then take it, roll it, enclose it in a tube of tinned iron; close the tube with solder, and preserve it if you will, indefinitely. You will thus always have a provision of light ready for such experiments as that of which Professor Wheatstone was a witness."

Since transcribing the above, we have been favoured by Professor Wheatstone with the picture taken in the manner described, and the distinctness with which the printed paper used as a negative is reproduced on the sensitised paper, is perfectly surprising. The action of the light, or whatever it may prove to be (for we are by no means convinced that it is light that produces the effect) is so energetic, that it extends beyond the edge of the orifice of the tube, and while the edge preserves the sensitive paper from the action of its contents on the paper immediately beneath it, a portion of the negative which is outside it is darkened.

We have also to announce another remarkable discovery of the same distinguished foreigner. Having prepared a paper with nitrate of silver and chloride of gold, he placed a negative upon it and enclosed the whole in a substitute for the ordinary printing frame, and submitted it to the action of *radiant heat;* the result answered his expectations. We have before us pictures obtained by him by these means, which are very distinct, even to the extent of reproducing legibly the inscription around a shield. We shall give a translation of M. Nièpce's paper in our next number, if it reaches us in time.

While on the subject of M. Nièpce's experiments, we may mention that Professor Wheatstone has brought with him to England specimens of photographs printed in different colours, as described in M. Nièpce's memoir, published in the "PHOTOGRAPHIC NEWS," of the 10th December of last year. They have an extremely pretty appearance, and are as clear and sharp as possible. The most beautiful is one of a reddish-brown colour, which, while it gives an agreeable tint to the picture, allows it to retain perfect whiteness in certain parts of it, as in the foam at the foot of the mill-dam.

THE SALE OF POISONS BILL AS IT AFFECTS PHOTOGRAPHERS.

From the number of letters we have received from correspondents, expressing their fears that serious obstacles will be thrown in the way of their purchasing some of the chemicals required in photographic manipulations, in the event of the Bill, introduced into the House of Commons by Mr. Secretary Walpole, Mr. Hardy, and Lord John Manners, passing into a law, we think it as well to state that their fears are groundless.

The Bill proposes that vendors of certain poisons, including some used in photographic operations, should be compelled to observe certain forms in vending them, but these in no degree affect the purchaser. There is no clause which says that the vendor shall be a chemist, consequently those who sell other photographic chemicals may sell the poisons specified also; and, inasmuch as every photographer must be personally known to some one or other of the vendors of these chemicals, it follows that he will obtain what he requires with the same facility as heretofore. The only persons among us who may experience a little annoyance in getting the poisonous chemicals specified, are beginners who may not be personally known to the vendor, in which case they will have to get a witness, of full age, who is known to him; and also photographers who are under age, who are not to be allowed to purchase them under any circumstances. Clause 5 runs thus:—

"No person shall sell any poison to any person who is unknown to the person selling the poison, unless the sale be made in the presence of a witness of full age who is known to the person selling the poison, and to whom the purchaser is known; and no person shall sell any poisons to any person *other than a person of full age*."

Now, as a very large number of photographers are under full age, it is obvious that, if the Bill be passed as it stands at present, it will compel these to evade the law, a thing which might be accomplished easily enough, but which, for manifest reasons, would be highly objectionable. What we would suggest, therefore, is, that a clause should be added to the Bill, *enabling vendors of photographic chemicals to sell any of the poisons included in schedule A to persons whom they know to be engaged in the practice of photography, even when they are under age.*

The following clause is that which chiefly affects purchasers generally:—

"Every person who sells any poison shall forthwith, and before the delivery of the same, enter or cause to be entered, in a fair and regular manner, in a book or books to be kept for such purpose, in the form set forth in the schedule to this Act or to the like effect, the following particulars of and in relation to such sale; (that is to say,) the date of the sale and delivery and the name and quantity of the poison sold, together with the name, surname, place of abode, and condition or occupation of the purchaser, and the purpose for which the poison is required; which particulars, so far as they are not within the knowledge of the seller, he is hereby authorised and required to inquire into of the purchaser, before the delivery of the poison; and in every case before the delivery of the poison such entries shall be signed by the seller and by the purchaser, and (where the sale is required to be made in the presence of a witness) also by the witness, who shall add his place of abode."

There is another possible grievance, and that is:—in the event of a photographer travelling about the country taking pictures, as many hundreds do in the summer months, being out of one of the poisons enumerated in the Bill, say cyanide of potassium, for example; although this may be absolutely essential for the continuance of his operations, he will be unable to obtain it, and the whole end and aim of his journey be entirely defeated. This difficulty would also be obviated by the modification suggested above.

GENERAL OBSERVATIONS ON PHOTOGRAPHIC POSITIVE PROOFS.*

BY MM. DAVANNE AND A. GIRARD.

ON SENSITISING—(*continued*).

On the Preservation of Sensitised Sheets.—If the different causes we have passed in review exercise remarkable influences on the definitive value of the proof—influences which the photographer ought always to bear in mind—there is another effect which should fix his attention in the highest degree: we allude to the alteration which the positive papers, prepared with nitrate of silver in the ordinary manner, undergo, in a variable, but generally very short, period of time—an alteration which rapidly renders them unfit for the production of a proof. Everybody knows that sheets thus prepared can only be preserved a few days even in darkness.

Positive papers prepared by peculiar methods—those with the chromates, for example—do not present this inconvenience to the same extent; they remain very much longer without alteration: but, independent of the drawback, that their use requires a fresh apprenticeship on the part of the photographer, they have none of them hitherto given such admirable results as the papers prepared with the nitrate of silver.

The alteration we allude to does not always manifest itself with the same intensity; it varies with papers of different manufacture; it varies even with sheets of the same origin. Let us first examine what may be the cause of this alteration. In the preceding part of our article, we have shown that the surface of the sensitised paper was formed by the mixture of two very distinct bodies—the insoluble chloride of silver, and the soluble nitrate of silver, employed in great excess, and remaining free on this surface. We have shown, moreover, that both the one and the other were requisite for the production of a good proof, and that it was only on the condition of their existing on the same sheet that effects of relief could be obtained upon it, as well as the half-tones, to which photographers attach so much importance.

The existence of these two different bodies on the surface of the sensitive sheet, naturally led us to examine if both of them intervened in the phenomenon of the alteration, or if one alone was the cause. Experiment has shown us the truth of this latter supposition; and we have found that, a sheet of sensitised paper being divided into two portions—the one remaining in its normal condition, the other well washed, so as to free it from the excess of free nitrate—that the latter portion, which then contained nothing but an insoluble chloride, retained its qualities in darkness for an indefinite period, without undergoing any alteration: as to the other half—that is to say, that which contained an excess of free nitrate—it began to change after the lapse of a few hours, and after three or four days was totally unfit for use. Besides, this preservative faculty of the chloride of silver remains constant, however the papers may be charged with this compound. Thus, in a series of experiments which lasted fourteen days, we have seen the parts of a sheet which contained an excess of free nitrate become tinted at the end of a few hours, and deepen rapidly; while the other parts, prepared on salt baths of 2, 5, and 10 per cent., which consequently were highly charged with chloride, freed from the excess of free nitrate by washing, were preserved all this time without any trace of alteration.

It seems, then, from this fact, that we may easily find the solution of the problem of the preservation of the sensitised papers in preparing them with chloride of silver alone, either by washing them after the nitrate bath, or, on removing them from this bath, by passing them in a solution of a soluble chloride, which would convert all the free nitrate in excess into an insoluble choride of silver. We do not believe, however, that this process would be applicable; we should obtain in this way, indeed, papers which would retain their qualities without alteration, but they would be unsuited for giving pictures of a high quality. We have shown, in fact, and

* Continued from p. 266.

every photographer has had the opportunity of verifying the fact for himself, that proofs with chloride of silver alone, without free nitrate, were always bad and incomplete.

It is therefore clear that the alteration of positive papers in darkness, is due to the action of the free nitrate of silver on the organic matters which form the body of the paper. Secondary causes may accelerate its activity: thus, the alteration will be so much the more rapid, as the nitrate may have been employed more concentrated, the degree of its penetration into the body of the paper greater, the time of contact more prolonged, and, finally, according to the tendency of the size used to combine with the nitrate of silver; circumstances, all of which our previous researches, joined to the observation that the free nitrate is alone the cause of alteration, render easy of explanation.

In fact, if the nitrate of silver is more concentrated, the sheet will contain, as we have demonstrated, more free nitrate, and hence be more susceptible of alteration. If the length of the pose on the bath has been greater than usual, the cause and effect will be the same; on the contrary, the richer the salt bath, the less free nitrate there will be, and the less the tendency of the paper to change.

(To be continued.)

COLLODION.

BY P. C. DUCHOCHOIS.

COLLODION is a solution of pyroxyline in a mixture of ether and alcohol, to which is added, for photographic operations, a small quantity of soluble iodide, of bromide, and sometimes also of chloride.

In principle, the ether gives the *solidity* of the collodion film, and the alcohol adds to its sensitiveness, and to the softness of the proof, by destroying the tenacity that the ether gives; however, it will be dangerous to force the proportion of alcohol, for a little solid, glutinous, and unequal film will be the result. The presence of alcohol is also necessary to dissolve the pyroxyline, iodide, or bromide, which are insoluble in absolute ether, and to prevent a too quick evaporation of the collodion that opposes the formation of an equal film, free from striæ.

If the amount of alcohol employed to prepare the collodion is too small, the iodide and bromide of silver, instead of being formed in the body of the film, are entirely formed upon its surface, and easily washed away. The same effect is also produced by a too weak silver bath; and, if it is concentrated enough, it will be necessary to add a few minims of acetic acid even when the bath is not alkaline, and does not give any reduction; the acid in that case appears to help to accelerate the combination of the iodide and bromide with silver. Sometimes, also, a collodion prepared with iodide of ammonium produces the same kind of imperfection; then the addition of a few drops of water is often a good remedy.

To prepare photographic collodion, neutral and anhydrous sulphuric ether only must be employed, containing little alcohol, and newly distilled from potash, in order that it may be free from oxidation, and from that peculiar property, which it acquires by long keeping, of decomposing the metallic or alkaline iodide and bromide of the collodion. The alcohol must be very concentrated, and well purified from any essential oils which destroy the sensitiveness of the preparations. However, its specific gravity ought not to be over 0·809, for an anhydrous collodion is far less sensitive than when it contains a little water, 2 or 3 per cent.; a larger quantity will give a collodion not very fluid, and a wavy film, liable, after fixing, to tear or peel off in drying. The proportion of alcohol and the quantity of pyroxyline vary according to the temperature; the higher it is, the more the quantity of alcohol augments—the lower it is, the larger must be the proportion of pyroxyline. The dose of iodide in the collodion must be proportioned in such a manner that the sensitised film presents, by transparency, a deep opal colour, through which it is impossible to read, although it is easily penetrable to light; for an opaque film is not very sensitive, and gives grey proofs (too equal); on the contrary, a film too little iodised gives too much vigour (contrast). In good conditions the collodion contains about one per cent. of iodine combined with a metallic or alkaline base. If a bromide is employed, its addition does not affect sensibly the proportion of iodide, and the quantity varies, according to the effect required, from 1·6 to 1·2 of bromide for one of iodide.

The thickness of the collodion depends on its preparation and the manner of bringing out the picture. With a collodion prepared only with iodide, and but little iodised, or in developing with pyrogallic acid, thin films are preferable; those a little thick give better results, and more intense negatives, with a collodion bromo-iodised, or when the sulphate of protoxide of iron is the developer used. The density of collodion depends also on the size of the glasses to coat—the larger they are, the thinner ought to be the collodion, since the evaporation being more considerable on a larger surface than a small one, the collodion leaves necessarily a thicker film. The progressive decomposition of collodion is determined by the acidulation of the ether resulting from its oxidation in contact with the oxygen of the air, or with a powerful oxidising base, such as potash, soda, ammonia—either if they are in excess in the iodide and bromide, or even in combination with them. It is also to be observed, that these bases react equally on the alcohol, and decompose it. On pyroxyline the action of the alkalies is very powerful; it is partly decomposed; the collodion becomes very fluid, and gives a thinner film, like rotten collodion, often opaque, and with less and less body. The acidulation of the ether determines the decomposition of the iodide; iodine is set free, reacts on the ether and alcohol, and gives birth to new compounds (iodoform, hydriodic, and iodic acid, &c.), which brings about the complete deterioration of the collodion.

By way of decomposition, the collodion loses its fluidity (if prepared with alkaline compounds), and forms a film thinner, having less body and powdery, and gives more intense and vigorous proofs—a property that it loses afterwards, and becomes less and less sensitive. The insensitiveness is easily explained by the fact that the iodic acid, at the time of rendering sensitive, is transformed in the body of the film to iodate of silver; it may also be explained by the formaion of nitric acid, which takes place every time that free iodine, iodic, and hydriodic acids are in contact with nitrate of silver. The augmentation of intensity would be in part the result, according to Mr. Hardwich, of the formation of an organic compound (formed by decomposition of the pyroxyline in presence of alkaline iodine *) containing some elements of the pyroxyline combined with a base, and having properties, like those of sugar, to form organic compounds with the salts of silver, reduced by light. According to Mr. Maxwell Lyte, that would be owing to the presence of nitrous ether, formed by the nitric or nitrous acid, mechanically held in the fibres of the pyroxyline: and it would not be unlikely, that this augmentation of intensity and vigour would be also determined by some acetate resulting through the decomposition of the iodide, which leaves the base in presence of the acetic acid of the ether. The same causes which produce the decomposition of the iodides, produce also that of the bromides, and the deterioration of the collodion rendered so much more active by it—as free bromine reacts on ether and alcohol more quickly than iodine in forming like compounds.

The metallic iodides and bromides, as well as the alkaline, are decomposed in the collodion either by the oxidation of the ether in contact with the air, or the acid in excess in the pyroxyline, or by reaction of the ether on the metal; for it is well established, that not only do potassium, sodium,

* Is it not the alkaline base that forms this organic compound? If to a plain collodion, modified by ammonia, and a few days old, some iodide is added, one obtains immediately a photographic collodion, having the property of giving intense negatives.

barium, oxidise in ether, but that some metals undergo the same effect in presence of the air. The deliquescent metallic iodides and bromides are not generally very stable, and are easily altered by the air and dampness (such are the iodides and bromides of magnesium, zinc, iron, &c.), and give a collodion which does not keep as well as with other metallic iodides. It must be also remarked that, contrary to the alkaline, these iodides and bromides, and even those of cadmium (which produce the most unalterable collodions), produce a thickening of the collodion, giving a more or less wavy film, before any apparent decomposition takes place.

The collodion is more quickly decomposed by iodide of iron than by any other metallic iodide; it thickens in a little time, and becomes like a jelly in two or three days if the proportion of iodide of iron is large. It is at least worthy of remark, that the pyroxyline is rapidly altered in a collodion prepared with pure iodine; this seems to confirm that theory which admits that, like the proto-salts of iron, hydriodic acid reacts on pyroxyline, and regenerates the cellulose. Heat hastens the decomposition of collodions. The action of light has been studied by M. Tiffereau, who observes, that a collodion exposed to the direct rays of the sun during one to three days acquires great fluidity and sensitiveness, and is able to give instantaneous proofs even in an unpropitious condition of light, but that it afterwards loses these properties, and becomes worthless in a few days.

Conclusions.—*A*. In the preparation of photographic collodions—1. To employ ether and alcohol perfectly neutral, and newly distilled on caustic potash. 2. To neutralise, by washing with *very weak** ammoniacal water, the acid that the pyroxyline may retain between its fibres, and to dissolve it only at the moment of preparing the photographic collodion. 3. To keep the collodion in well-corked bottles without emptying, and sheltered from light and too great heat. 4. When the collodion assumes a coloration, turning to red, to put in it some thin pieces of pure cadmium, to which the iodine and bromine combine in proportion as they are set free.

B. For very fluid collodions, to iodise with alkaline iodide and bromide. This collodion will not keep a long time; but when the decomposition is not very advanced, it will work as well as any other.

C. To obtain a collodion, giving a powdery, rotten film,† as required for dry processes, to add a few drops of ammonia: the decomposition of the pyroxyline being very rapid, the collodion will be worthless in a week or two even with a little amount of alkali.

D. To prepare very stable collodion:—1. To proscribe any alkaline iodide and bromide, especially those containing an excess of base and the iodide of ammonium, which, by its instability, retains always iodine and releases ammonia; to prefer metallic iodides and bromides, with the exception of those of iron. The iodide and bromide of cadmium give the most stable and quick collodion.

INSTANTANEOUS PHOTOGRAPHY.

BY C. A. SEELEY, ESQ.

For ordinary photographic works no more sensitive preparations than those commonly employed are needed. Most persons who sit for a portrait can keep still ten or twenty seconds. Photographic effects are more under our control, and otherwise more satisfactory, when the time of exposure is easily counted.

Yet every photographer, at some time, feels the want of a more rapid and certain process than any now in use. For moving objects, as in a sea or cloud view, the common methods do not answer well, and especially for taking portraits of children or nervous persons, we want to make an impression instantaneously.

Collodion, prepared with iodide of iron, has been found to be the most sensitive of all photographic preparations. Such collodion, however, has not come into general use, from the fact that the bath, after the dipping of two or three plates, becomes unfit for use; the collodion also deteriorates more rapidly than any other. If these objections to the use of iodide of iron can be removed or obviated, it would soon come into favour. The following plan I consider a fair solution of the problem:—

The derangement of the bath cannot be prevented, but if its good qualities can be immediately restored after the derangement, our purpose is effected. For a method of recovering the bath, expose the nitrate of silver solution in a colourless glass bottle, to the sunlight. The theory is evident. By the action of light, the nitrate of silver destroys and precipitates the injurious matter. When the operation is complete the solution is perfectly colourless, and devoid of smell. The time required for the exposure would evidently depend upon the condition of the bath and intensity of the light. If the impure bath is already acid, it should be made neutral by carbonate of soda or potash, before the exposure.

In this case the remedy of exposure to light is peculiarly prompt. The rectifying the bath may not require more than ten minutes, when it is again fit for use. It would be advisable in many cases to have two or even three bath solutions, so that while one is being restored another will be in working condition. To lessen the expense, the bath-holder may be very narrow, so as to cover the plate with a small quantity of solution. As to the collodion, I would recommend that a stock of plain collodion should be kept on hand, well settled, and that only a small quantity be sensitised at the same time.

Critical Notices.

The Panorama of Lucknow in the Photographic Exhibition.

Since we wrote our notice of the Photographic Society's Exhibition, there has been added to it a most interesting and clever Photographic Panorama of Lucknow, together with some other photographic landscapes and portraits.

Of all the panoramas we have seen, taken by means of photography, we have no hesitation in stating that this is one of the most perfect. The copies exhibited at the Exhibition, we may state, however, are by no means such clear impressions as we have seen from the same set of negatives. One thing which must strike every one who looks at these photographs is, the great uniformity of tone, which is so perceptible throughout the pictures. Not only is there great effect produced in looking at these pictures as a whole, but closer inspection only reveals new beauties. In many parts of this photograph, one is almost led to think that it is a copy of a panoramic picture, as there are such pretty little patches of trees and shrubs clustering here and there. As an architectural photograph, the panoramic view of the Kaiser Bagh is most interesting: we are informed that this large photograph, though representing an immense area, is only of a portion of the building which constitutes one palace. If this is a portion, what must be the whole?

To get an idea of the extent and splendour of Eastern palaces, of which we have read so much—not only in fairy tales, but in the more interesting contributions of "our own special Correspondent," we would advise anybody to go and see this photograph; it strangely contrasts with the blotched and blurred copy which Mr. Frith exhibited of Cairo. The other Indian views are of a highly jaundiced tone; this, perhaps, is owing to the great amount of varnish on them. Of the portraits—we cannot say much, they strike us as being very much like the well-known series of Crimean photographs by Fenton. The landscapes are very cleverly executed; and the sites are most artistically selected. "The great Emambara of Ashnifoodowlah," is a very beautiful photograph; and has many points about it of photographic as well as historic interest. Many of these views, we understand, are by Robertson; who is at present engaged in taking photographic pictures of the most interesting scenes and places connected with the war in India.

* A too strong alkaline solution will render the pyroxyline insoluble.

† Old brown collodions, prepared with alkaline iodide, possess such properties.

Stereoscopic Views in the North of England, and in Wales.—By Messrs. OGLE and EDGE, Preston.

THESE gentlemen deserve the thanks of the artistic, for the very excellent series of views they have published. They consist of English lake scenery, Welch landscapes, and English ruins. Of the quality of these slides there cannot be two opinions; they are clear, well defined, and, in many cases, very brilliant. Perhaps the only fault that can be urged against them is, a slight reddishness of tone. In some instances this is more agreeable than otherwise; but, generally speaking, we should prefer the red a little more subdued. "The Dungeon Ghyll, Langdale Pikes, Westmoreland," is a most vivid and beautiful picture. "Near Stock, Ghyll Force, Ambleside," is a wonderful specimen of clear printing; and, at the same time, it exhibits a great amount of detail in the foliage, while the water, as it rolls over the rocky bed of the river, is caught with great and striking force. But of the lake scenes, the best is "Rydal Water, with Hartley Coleridge's Home and Nab Scar in the background." The rendering of the water in the picture is really beautiful, while the background is clear and distinct; the whole picture seems, as it were, the very embodiment of tranquillity. In giving a happy illustration of "The brook that brawls along the wood," Messrs. Ogle and Edge have been eminently successful in the selection of a spot that exactly represents the idea. It is a charming little picture. We will not go into particulars with regard to the other slides before us; suffice it to say, that the views of Tintern, Rievaulx, and Fountains Abbey, are done in a manner that would bear comparison with Bedford's best and happiest views. Of all the views we have ever seen of "Tintern Abbey," we have no hesitation in saying that the view from "The North Aisle, looking West" (No. 4), is one of the best. It gives the spectator such an idea of distance, and impresses him with the grandeur of the building in a manner that cannot easily be forgotten. This series contains the most choice and beautiful views that we have seen. They are very artistic; and the selection of sites has been most careful and judicious.

Lessons on Colouring Photographs.

RELATIONS AND HARMONY OF COLOURS.

WE have been speaking hitherto simply of the contrasts of complementary hues and the harmony resulting therefrom. There are, however, other contrasts pertaining to these complementary relations, arising out of the effect of colours in regard to perspective, *chiaroscura*, and warmth or coldness.

In relation to perspective, blue, which is the least positive of the primary colours, is called the most retiring colour, as it recedes most from the eye, and is the best representative of distance; whilst orange, its complementary, is the most advancing colour. The student may easily convince himself of the fact of these characteristics by placing an object coloured blue and another coloured orange, both colours having the same relative intensity, side by side, and then retiring from them to some distance; he will find that the blue is much the soonest lost to the eye and mingled with the distance, whilst the orange at the same time is vivid and distinct. The same characteristics will, of course, pertain to the compound colours which are most nearly allied to these respective hues. As regards black and white in this respect, black is the most retiring, white the most advancing.

In respect to light and shade, setting aside black and white, which, as we have before said, are not regarded as colours, yellow is the most luminous colour, or the most nearly allied to light, regarding light simply as an illuminating agency; whilst purple, its complementary, is most allied to shadow, and is the deepest pure hue. Of the uncompounded or elemental colours, blue is the representative of shadow, and yellow of light, whilst red, occupying an intermediate position, is analogous to grey the intermediate of black and white.

Blue, as well as being the most retiring colour, is at the same time the coldest—all colours being cooled by distance. Orange, its complementary, is the warmest of all colours; and so in regard to the semi-neutrals, they are warm or cold just in the degree that their component parts partake of these full hues.

Red and green, which do not contrast as to light and darkness, do so to some extent as to warmth and coldness, the more so as the red may incline to orange as in scarlet, and the green to blue. The special contrast of this pair is, however, that red is the most positive and exciting of all colours, and green the most quiet and soothing.

Besides these contrasts of colour with colour, a special influence is exercised by the contrast of intensity in the same colours, and by black and white in juxtaposition or combination with them. Two tints or shades of the same hue of different degrees of depth placed side by side, appear at once in a modified intensity; the deepest gaining additional depth, and the palest appearing still paler; this modification appearing most marked at the points of contact. Any colour having a luminous complementary, gains in richness and intensity by contact with white, as indeed to some extent do all full hues; but broken tints of any colour luminous in itself suffer by contact with white. On the other hand black should not be opposed to colours which have a luminous complementary, as both must inevitably be impoverished by the contrast; whilst any colour having a dark complementary, and of course, more or less luminous in itself, will gain by the proximity of black, which also is enriched by the luminous contrast. Thus, blue or purple, and all colours nearly allied to them, would suffer in depth if placed in contact with black, whilst the black itself would be tinged with the complementary orange or yellow, and assume a rusty tone. White, on the other hand, placed in juxtaposition with similar colours, by assuming a tint of the same complementary hues, would enrich the blues or purples, or analogous colours. Black placed in contact with orange, yellow, or red, and similar colours, would itself be enriched, assuming something of the blue, purple, or green tone complementary to these hues, and would at the same time by its contrast give brilliancy to these and analogous colours. The effect of a neutral grey is good on all full hues, which give richness and intensity by contrast.

In the compounding of colours on the palette it must ever be remembered that the effect is altogether different to that produced on the eye by their juxtaposition in a distinct unmixed form, in however small portions, as in hatching or stippling, or by their superposition, as in glazing. White, it must be remembered, when mixed with any colour, always mars its transparency, and hence the horror which the great master of colouring, Rubens, expressed against the slightest admixture of white in shadows, which should always possess the utmost transparency. Black mixed with any colour always detracts in such degree from its purity and brilliancy.

We may here remark that any discordance or want of harmony in colouring is most apparent where the colours are used in their full intensity; and the purer the tints, when harmoniously combined, the more beautiful the effect. There are cases, however, in which, from colours inherent in the model and absolutely necessary to the picture, it becomes necessary to introduce a mass of one colour, which disturbs the harmony, as in the case of a soldier's uniform: in such case the discordance will be less marked and offensive if the prevailing colour be kept as low in tone as possible, and as much as possible in shadow. Obscurity may thus to some extent conceal the want of harmony; but should never, notwithstanding the example of some great painters, be substituted for it.

(To be continued.)

OUR readers will regret to hear that M. Canson, the paper-maker, at Annonay, whose name is so well known to photographers, has recently met with a severe misfortune. The whole of the paper and rags, &c. on his premises, amounting in value to £25,000, were totally destroyed by fire. Like most of the fires which take place in paper mills, it commenced in the rag warehouse, and is supposed to have been accidental.

Photographic Chemistry.

CHEMICAL MANIPULATIONS—(*continued*).

Reduction (continued).—Perhaps a better, as well as a similar, result may be obtained, by effecting the reduction of the sulphide of silver by means of saltpetre. The mode of proceeding in this case is, to dry the sulphide of silver in an iron pot, in a fireplace which has a good draught, until the sulphur begins to burn—the evaporation of the moisture being accelerated by stirring. When quite dry, the black residue is taken, little by little, and submitted to a temperature which must not exceed a dull red heat; the sulphur will take fire anew, and burn until the greater part of the sulphur is consumed, and the black mass which remains is sensibly pure sulphide of silver. During the operation the matter should be constantly stirred and crushed with an iron spoon.

It is extremely important that the substance should be heated for a sufficient length of time to consume all the sulphur in excess, otherwise a detonating mixture will be formed by its union with the saltpetre which may give rise to serious accidents: at the same time care must be taken not to exceed a dull red heat, in order to avoid the melting of the sulphide of silver, which would, in that case, be exceedingly difficult to pulverise—an operation which must be performed as soon as the whole has been baked sufficiently, and intimately mixed with a like quantity of pulverised saltpetre. While this is being done, a crucible, placed on a smelting furnace, is heated to redness, and the mixture ladled into it by means of an iron spoon, each spoonful being only added when the preceding spoonful is completely fused, in order to avoid loss from deflagration, which might cause projection of the mass out of the crucible. When the crucible is full, the fire is a little strengthened for about half an hour, that the mass may be rendered thoroughly fluid; after which the grains of silver will collect together at the bottom of the crucible, and the flux will float on the surface. When the operation is finished, the fire may be extinguished, and the crucible left to get cold to prevent the possibility of accidents; after which it may be broken, and the ingot of silver taken out.

These methods of proceeding, which are by no means complicated to read, are still simpler in practice. It may be objected to them that they give rise to a sulphurous odour; but this odour is less hurtful, and more easily endured, than the nitrous acid and chlorine vapours which are given off in using aquafortis, or than the vapours of hydrocyanic acid, which are given off when cyanides are treated with acids. The expense for apparatus is very trifling, the principal item being the smelting furnace, which would not cost more than fifteen shillings, and would be available for other purposes than that described, and the cost of the fuel would not be one hundredth part of the value of the silver it would smelt.

Sensitised paper cuttings, spoiled sheets, and, generally, all papers which may be supposed to contain silver, should be reduced to ashes, and the ashes mixed with an equal weight of dry carbonate of soda, to which must be added a little saltpetre, and the whole melted in a crucible heated to a strong red heat. When cool, the ingot of silver will be found at the bottom of the crucible.

If it be desired to prepare this silver so as to use it in manufacturing nitrate of silver, it should be melted in a crucible; and while the metal is in a state of fusion, the crucible should be seized, carefully and firmly, with a pair of pincers, and the contents emptied into a pail of water from a good height; the result will be, that the metal will be divided into small granules. If this granulated silver contains any portion of gold, it will be liberated when the silver, with which it is alloyed, is attacked by the pure nitric acid, and dissolved, and the gold will be deposited, at the bottom of the capsule, in the form of a black powder.

(*To be continued.*)

Dictionary of Photography.

BICHROMATE OF POTASSA.—A beautiful red-coloured salt, crystallising in anhydrous four-sided prisms. It is composed of two parts of chromic acid and one of potassa. It is prepared by acidulating the neutral chromate with sulphuric acid, and allowing the solution to crystallise. It reddens litmus paper, and is soluble in ten times its weight of water. Its application to photography was first made by Mr. Mungo Ponton. Paper, immersed in a solution of bichromate of potassa, is powerfully and rapidly acted on by light. This paper is not sufficiently sensitive for the camera, but answers an excellent purpose of taking drawings of dried plants or copying prints. To effect this, give the paper a sizing of starch; steep it in a weak solution of iodine; and then wash it in a large quantity of water, when it will take a very fine blue tint. If this is not uniform, the paper must be re-sized, and again soaked and washed; it is then soaked in a concentrated solution of bichromate of potassa; the superabundant moisture taken off with blotting paper, and dried thoroughly by the fire. When the copy is obtained, it is washed, dried, and steeped in a weak alcoholic solution of iodine for fifteen or twenty minutes, and carefully dried with blotting paper. If the drawing is not sufficiently distinct, this soaking and drying may be repeated; and if a layer of gum arabic be applied while still wet, although it at first loses a little of its tone, it is greatly improved when dry. In combination with gelatine, or an analogous body, bichromate of potassa forms the basis of Mr. Fox Talbot's patented improvements in photographic engraving, a principle which is now being so plentifully re-discovered both at home and abroad, under the title of carbon printing, nature's engraving, &c. &c.

BICONVEX.—Having two convex surfaces; *i. e.*, a biconvex lens is bounded by two convex spherical surfaces, whose centres are on opposite sides of the lens. Parallel rays of light passing through a biconvex lens are rendered *convergent.*

BICONCAVE.—Having two concave surfaces; *i. e.*, a biconcave lens is bounded by two concave spherical surfaces, whose centres are on the same sides of the lens. Parallel rays of light passing through a biconcave lens are rendered *divergent.*

BISMUTH.—A pinkish white metal, very brittle. *Pearl powder* is a subnitrate of bismuth. It enters into the composition of the so-called fusible metals. The following table of the composition of some of these alloys may be of interest:—

	Bismuth.	Tin.	Lead.	Fusing Point.
Newton's Alloy...	8 parts.	3 parts.	5 parts.	202° Fah.
Arcet's Alloy......	2 „	1 „	1 „	199·5 „
Another	5 „	2 „	3 „	197 „
Another	8 „	8 „	8 „	197 „

BITUMEN OF JUDEA.—(See *Asphaltum*, p. 247.)

BROMINE.—An elementary body, discovered by M. Balard, in 1826. It is obtained by passing a current of chlorine through the liquid which remains after the evaporation of sea water to obtain common salt. This liquid is commonly called bittern, and usually contains sulphates and chlorides of sodium and magnesium, with a small quantity of bromide of magnesium. When the chlorine is passed through the bittern, it assumes an orange tint in consequence of bromine being set free from its combinations, the chlorine uniting with the magnesium of the bromide of magnesium, and forming chloride of magnesium. The liquid containing the free bromide is then agitated with ether, and the mixture is allowed to stand until the ethereal portion holding the bromine in solution floats on the surface. This is then carefully poured into another vessel, so as not to disturb the residuum, and agitated with a solution of potassa, by which means bromide of potassium and bromate of potassa are formed. The whole is then evaporated to dryness, and submitted to a

dull red heat; the residuum is then powdered, mixed with pure peroxide of manganese, and placed in a retort; sulphuric acid diluted with half its weight of water is now poured in. Red vapours immediately arise, and condense into drops of bromine, which are collected by plunging the neck of the retort to the bottom of a small receiver containing cold water. The bromine forms a stratum beneath the water, and may be collected and further purified by distillation with chloride of calcium.

Bromine is liquid at the ordinary temperature, of a deep reddish colour, and an insupportable irritating odour similar to chlorine. It freezes at 4°; boils at 116°·5; is about three times as heavy as water; is very soluble in ether, less so in alcohol, and very slightly so in water. It is a poison which acts very powerfully on the organs of respiration, and the greatest care should therefore be taken to guard against the inhalation of its vapour. Bromine is one of the most important agents in photography, but its value is hardly appreciated yet by the generality of operators.

(*To be continued.*)

A Catechism of Photography.

THE REMOVAL OF COLLODION FILMS.

Q. Is it possible to employ any substitute for glass in the collodion process?

A. It is, as the various experiments which have been made from time to time, in order to ascertain this important fact, have resulted successfully.

Q. How are these results obtained?

A. By the use of a prepared film on the glass, which can be readily and perfectly removed, so that the same glass may be used frequently. The film adheres firmly to the glass during the preliminary operations and the taking of the image, but can subsequently be removed without injury.

Q. What mediums are used for this purpose?

A. Gutta percha, which possesses the good qualities of glass in its great transparency and evenness of surface. At the same time the cohesion is perfect, and the cost trifling.

Q. By whom was this process invented?

A. The invention is claimed both by Mr. Archer and Mr. Reade; the former took out a patent for the use of the substance, while the latter published the process in a journal devoted to the art.

Q. How is this process conducted?

A. The gutta percha is dissolved in benzol by the application of heat.

Q. What is benzol, and how is the heat applied to it?

A. Benzol is one of the hydro-carbons of coal tar naphtha; and immersing the bottle which contains it and the gutta percha in hot water, is sufficient to render it soluble.

Q. How is the solution applied to the glass plate?

A. By pouring it on and immediately drying it over a spirit lamp.

Q. Does the medium adhere to the glass?

A. Perfectly; and has no tendency to separate from it on subsequent immersion in the nitrate bath.

Q. When the medium is firmly attached to the glass, how is the process continued?

A. In precisely the same way as though the gutta percha were the glass itself; it is then covered with collodion, iodised and sensitised in the usual way, developed, fixed, and varnished.

Q. When the process is complete, how is the gutta percha disengaged from the glass?

A. The point of a penknife is passed round the edge, it is then placed in water for a minute or two, and the gutta percha separates with great facility from the glass. When dry, place the film between two pieces of paper, cut it to any required size, and you have a negative ready for the printing frame, as valuable in every respect as the glass negative.

Q. Does not the gutta percha dissolved in benzol have a tendency to become opaque?

A. It does, but this defect is prevented by dissolving the benzol film when dry in chloroform, and then using the chloroform film for the proposed purpose.

Q. Why is this preferable to the gutta percha alone?

A. Because it is certain, under all circumstances, to retain its perfect transparency.

Q. Is the process described that which was introduced by Mr. Reade?

A. It is,—but agrees in all essential particulars with Mr. Archer's plan.

Q. What is Mr. Archer's plan?

A. This gentleman has included in his patent two methods of applying the solution of gutta percha. The first method is thus stated: Pour on the clean glass plate a quantity of the solution of gutta percha in a similar manner as for coating the glass with a film of collodion. When this film is dried, the iodised collodion is poured on and immersed in the silver bath. The plate is exposed, developed, and fixed. The glass plate with gutta percha and collodion film attached to it is immersed in cold water, which presently causes the two combined films to separate readily from the glass. The second method is: Prepare the glass with iodised collodion, and proceed with the process in the ordinary manner. When the collodion picture is dried, pour on it the solution of gutta percha; when the plate is covered, hold it in a horizontal position for about a minute to thicken. Draw off very gently through a funnel into the bottle the excess of solution, and gradually raise the plate vertically over the funnel.

Q. What is the result of this process?

A. The benzol rapidly evaporates, leaving on the collodion picture, and in close contact with it, a coating of gutta percha. The back of the plate may then be held towards a clear fire, in order to hasten the hardening of the gutta percha. It must subsequently be immersed in cold water, when the combined films separate in one sheet from the glass; that is to say, the collodion picture is removed from the glass with the coating of gutta percha.

Q. Is the collodion picture so removed capable of being used?

A. It is; being in every way as perfect as when in the glass.

Q. Is the glass itself uninjured by the process.

A. Yes; and may be used again after the ordinary cleaning.

Q. Are not other media used for the removal of collodion films beside gutta percha?

A. Yes; paper prepared for the purpose is frequently employed.

Q. How is the paper prepared?

A. Sometimes with albumen and sometimes with gelatine.

Q. How is the paper prepared with albumen?

A. By being dipped in a bath of albumen, formed of white of eggs beaten up and then allowed to settle; the paper should be allowed to remain three or four minutes in this, then be thoroughly dried for future use.

Q. How is the albumen paper used in removing the picture from the glass?

A. It is applied to the glass after the picture has been fixed, and by a free application of water the film is dislodged from the glass and attached to the albumenised paper.

Q. How is the gelatine paper prepared for this purpose?

A. By floating it on a bath prepared in the following proportions: one ounce and a half of pure white gelatine to a quart of distilled water.

Q. How is the gelatine paper to be applied to the glass?

A. While the negative which is to be removed is still wet, the glass should be placed in an horizontal position, the collodion upwards, and covered with an even sheet of water;

the paper, cut to the size of the glass, must then be placed in a bath of filtered water for a few minutes, and then laid on the surface of the water which covers the collodion. The glass must then be slightly inclined until paper and glass are brought into contact, when they immediately adhere to one another and the collodion picture is transferred from the glass to the paper.

Q. How is the paper separated from the glass?

A. As soon as both are dry, the corner of the paper should be raised with a penknife to ascertain if the transference have been successful; if so, the paper may be carefully removed, and will bear away with it the collodion image; if the process has been unsuccessful, the paper and glass should both be placed in the bath again as before.

(To be continued.)

Correspondence.

PORTABLE DARK TENT.

SIR,—Enclosed, I have ventured to send you two photographs of a dark tent which I have constructed, and which I think has some advantages over those in general use: to us of the camera who prefer *seeing* what we are about, a simple and portable tent, capable of manipulating large as well as small plates with perfect facility, would be acceptable in more points than one. The cost would not exceed one fourth of what is usually charged for one of the same capabilities.

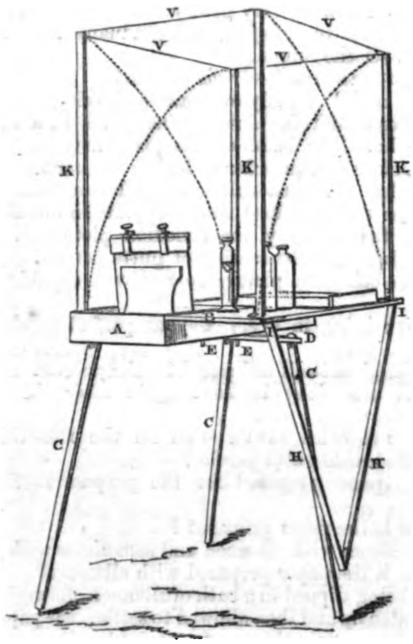


Fig. 1.

The box A, which forms the table, is made of light deal wood, ½ an inch thick (or less), dove-tailed together at the angles, and is 3 feet long, 13 inches wide, and 3½ inches deep, inside measurement. The lid B should be "clamped" with cross pieces grooved into the ends to prevent warping, and be hinged so as to open level with the top of the box. The legs C C C are of beech, tapered towards the bottom, and having a screw turned on the top (which any turner can do); two of them screw into blocks (also of beech) about 1 inch thick, glued inside in the front corners of the box, the third into the projecting piece D, at the back, which is fastened at the edge and middle of the box with wooden thumb-screws E E, either screw being removable, so as to allow it to perform a quarter of a circle, and lie along the box when travelling. The back leg is provided with a small staple at F, to admit the point of a wire driven into the bottom of one of the pieces H H, which fold together at F with a hinge (*see Fig.* 2), and when open support the lid

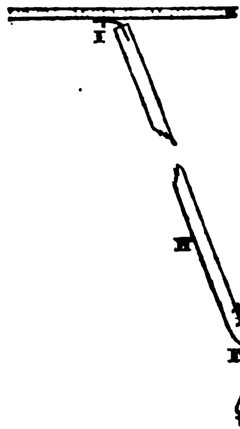


Fig. 2.

(*see Fig.* 2). Four pieces of deal K K K (about 1 inch wide and ½ an inch thick) are hinged to the upper corners of the box, as shown in the engraving, so as to pass each other in the direction of the dotted lines on disengaging the wires L L at one end only, the other end being looped over small wire staples in the upper part of the uprights, so that they fall down and fold, one with each of the uprights. It now remains to fit the covering, which consists of one thickness of black glazed calico, and one thickness of yellow calico (the

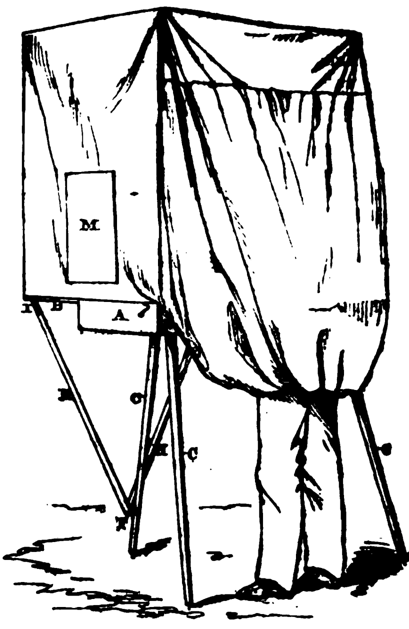


Fig. 3.

former being outside, of course); it is made to fit exactly over the top, back, and ends of the upper framework. The front piece is shaped like the section of a truncated cone, the width of the top being the length of the box, and the bottom descending about 18 inches below the box, and extending the same beyond each side; this piece is sewn into the front and forms a sort of hood. The open space below the box *inside* the hood is supplied with a piece of the stuff used, nailed along the inside of the box just below the edge. The

whole is now to be nailed round the other three sides of the box and lid on the inside with small tacks; and on folding down the uprights, the tent can be neatly doubled up to allow the box to be closed, the legs can now be unscrewed and laid inside, and the lid fastened by means of a strap or other contrivance. I forgot to mention, that the window M is made by cutting out a square of the black stuff, and inserting two thicknesses more of the yellow linen.

JOHN C. TWYMAN.

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PAGES FROM THE NOTE-BOOK OF A TRAVELLING PHOTOGRAPHER.

SIR,—I believe my last communication concluded by stating that I had taken a photograph of a turreted gateway of a building formerly inhabited by Edward III. and his wife. The next I took was the north side of the Kauter, a square planted with trees and surrounded by some large buildings; this gave me three or four good pictures; and another was furnished by the *Maison des Bateliers*, where the guild of watermen formerly held their meetings. It stands in the Quai aux Herbes.

The belfry, which is 280 feet high, makes a good picture; it was once used as a watch tower, and the tocsin bell was hung in it, the sounding of which summoned the citizens from their houses in cases of alarm. On the top of the spire there is a gilt dragon which was taken from the top of the spire of one of the Greek churches in Constantinople, during the Crusades. I was obliged to take it in two portions, but by approximating the edges of the negatives as closely as possible, with a very thin film of gelatine between them, I am able to print positives which scarcely allow the break to be discerned unless carefully looked for.

The Hotel de Ville gives a very good picture, and so also does the University, which is a modern building, with a fine portico; a copy from that of the Pantheon at Rome.

The Cathedral of St. Bavon offers much greater inducements to photographers to operate inside than outside the building. I do not regret the trouble I took to obtain a picture of its external aspect; but if, as is possible, I pay another visit to Belgium in the ensuing summer, I shall endeavour to make arrangements for taking a series of views of the interior and its contents. There are numerous chapels in it which would give a beautiful series of stereoscopic negatives, and a fine picture might be made of the high altar, on which stands a statue of St. Bavon, and in front of which are four high copper candlesticks, which were once the property of Charles I. of England. They bear the English arms; and it is supposed that they were formerly in St. Paul's or Whitehall chapel, and, after that monarch was beheaded, were sold and sent to Belgium, though it is not improbable that they may have been taken there by some of the royalists who fled from England to Belgium at that time.

Like Bruges, the objects of interest in Ghent are by no means confined to those I have mentioned. There is scarcely a street which does not contain several houses of a quaint style of architecture, and the wooden fronts of some of them are most elaborately carved. Some of the prettiest pictures I have I took in the early morning, in the streets of the city, which, though far from being so crowded as they once were, are by no means so deserted as those of Bruges. Your readers are no doubt familiar with the history of Ghent, and if they are not they will hear it all, and more, when they visit that town, from the idle vagabonds who infest the railway station, and hang on to you, like a limpet to a rock, the moment you set foot in the streets. It is in vain that you say you do not require their services; they stick to you wherever you go, and often have the impudence to follow you into a shop if you enter it to purchase anything, doubtless with the intention of levying black mail on the shopkeeper afterwards, on the pretence that they have brought him a customer. I have got out of a train early in the morning, and left my luggage at the station while I went to look through the town, to see if there were any buildings in it worth stopping to take; I have been set upon by one of these fellows the instant I left the station, and he has stuck to me throughout the entire day. I went into a barber's shop to perform my ablutions, and the fellow followed me in and entered into friendly conversation with the scraper of chins; when I left, he followed me. Threats of the police were of no avail, and this I was not surprised at, for if it is difficult to find a policeman in London when you want one, it seemed to me almost an impossibility to find one under similar circumstances in Belgium. I went into an hotel to dine, and when, after I had been engaged an hour in this interesting occupation, I looked out of the window, the first object that met my eye was my vampire, seated on a stone opposite, and patiently smoking a short pipe. I thought I would get rid of him by going out by another door than that by which I had entered, and had got almost to the end of the street and was congratulating myself on being at last free, when a gruff voice close to my ear said—"Zir, 'das vas der house ver der Spanish killed sexteen mens, and——." I interrupted him to point out the uselessness of wasting his time upon me, and suggested that a good many English were coming from Ostend, and that he might lose an opportunity of benefiting himself by keeping near me. All was in vain; I might as well have spoken to a statue. If I stopped to look at a house, he immediately began a tale which, I firmly believe, was, in most cases, invented on the spot. If I went into a church, of course he followed me in there, not, as may be supposed, with the intention of saying his prayers, but with the double object of keeping me in sight and making a little property out of me; which he did, in this way:—In most of the churches in Belgium, that contain paintings of any note, these paintings are covered with a screen of green baize; and to see them it is necessary to find the official charged with the duty of showing them, and, as a matter of course, paying him a fee for his trouble. Without waiting for the verger, or whatever he was, to come to me, my persecutor started off in search of him, and after the exhibition was over I observed a transfer of sundry copper coins from the hand of the verger to that of the extortioner. In this way he followed me from nine o'clock in the morning until five in the afternoon, and at the end of that time had the impudence to demand five francs for his attendance on me. As I have already said, one or two of these vagabonds may be made available to carry your apparatus, and if your time is limited he may be really useful in taking you to places of interest, with the least loss of time. I have generally had plenty of time at my disposal, and have therefore adopted a different plan, in some cases. I walked about the town with a local guide book for a day, or two, or three, according to its size, making a note in my memorandum book of the views I proposed taking, and then hired a cab, into which I placed my apparatus, and drove, at the earliest possible moment in the morning, to the different places I had marked out in succession. In this way I did not lose a moment, and was generally able to take all I wanted, both in the town and suburbs, in one day.

VIATOR.

Photographic Societies.

THE FRENCH PHOTOGRAPHIC SOCIETY.

AT the last meeting of the French Photographic Society, M. Regnault, in the chair, after the routine business had been disposed of, M. C. Silvy presented to the society studies of animals from nature; Baron Marguerit, a series of pictures of different parts of France; M. Jamin, some copies of engravings of large dimensions taken with a French orthoscopic object-glass constructed in his factory; M. Delahaye presented to the society in the name of MM. Leon and Masson a plated copper bas-relief, representing allegorical figures supporting the medallion of MM. Daguerre and Niepce.

M. Opsor then addressed the meeting on the subject of a dry collodion process employed by him, the mode of developing being new. His description was not considered sufficiently explicit, and he was requested to furnish more minute details. He also gave the society a description of an improvement he had introduced in the manufacture of negative frames, and of boxes intended for carrying sensitised glasses. His plan is said to completely secure the interior of the frame from the introduction of light, and is equally applicable to all the apparatus from which it is desired to exclude light.

M. Asser, of Amsterdam, forwarded to the society some photographic proofs which were obtained by a process discovered by him, based on the use of printer's ink. He wished to be excused from giving the details of his process just yet, but he wished the society to test their permanency in any way they pleased.

M. de Brebisson's paper on the subject of pictures obtained by a carbon process was next read. The author presented some proofs.

In reply to an observation made by MM. Salmon and Garnier on the analogy of their method with that pursued by M. de Brebisson, M. Girard pointed out that the gentleman in question did not claim the credit of the discovery.

M. Delahaye dwelt on an interesting peculiarity, mentioned by M. de Brebisson, to the effect, that one finds less sensitiveness in bichromate of potassa that has been exposed to the light for a considerable time in the form of crystals, than in the freshly prepared bichromate.

A note from Mr. Maxwell Lyte was next read, on the subject of a new gold toning process.

Dr. Valtier presented sundry positive proofs, some of which were silver, and others by a process based on the use of a substance known as *oxyethylate*, the price of which is less than nitrate of silver. He was ignorant of the nature of this substance, as well as of the name of its inventor. The examination of the prints was deferred until the substance in question had been duly presented.

M. Girard protested against the use of such a barbarous term as that of *oxyethylate*.

The following letter from M. Quinet was next read:—"At the last meeting of the French Photographic Society, M. Ferrier presented, in the name of M. Hermagis, a new memoir on the stereoscope with parallel spheres. . . . . I see that the improvement introduced by M. Hermagis in the stereoscope, consists in the use of lenses with parallel spheres, placed parallelly towards the proofs contained in eyeshades five centimètres high, allowing the eyes to be placed in the axes of the luminous cones. Also, that the merit of this improvement has been disputed with him by M. Claudet, who says besides, that for the coincidence of the images to take place the lenses must be a little inclined. Judging from this, and from my knowledge of the effects produced by the optical part of the stereoscope, I believe I may say that they are both beside the truth. If M. Claudet inclines his lenses, it is to force the visual ray to pass through the edge of the glass, and consequently through the prismatic part of the lens. It is the same with M. Hermagis, who is obliged, in order to avoid the error with which he reproaches M. Claudet, to have eyeshades five centimètres in height. Here again it is through the prismatic part of the lens that the images are seen. . . . . I have here one of M. Hermagis's stereoscopes, half the object glasses of which I have masked; and if the phenomenon described by him exists, the relief could not be seen, for the eye is prevented from looking directly and parallelly at the image. The middle of the object glasses being masked forces the two visual points to converge towards the centre of the apparatus, to afterwards join, by diverging, the two images, after having traversed the two prismatic parts of the lens.

M. Moigno remarked that M. Hermagis's note in no way agreed with the theory of the stereoscope. The note stated that he had obtained the appearance of stereoscopic relief with two identical pictures, which was impossible, and he must have confounded stereoscopic relief with the much less considerable relief of monocular vision. Every one is aware that, when a photograph is looked at with a single eye, a certain relief is visible, which disappears as soon as the proof is looked at with both eyes. This was the reason why M. Hermagis was obliged to use high eyeshades to increase the distance between the eyes and the pictures, and thus obtain a relief for each of them due to monocular vision.

The President admitted the soundness of M. Moigno's conclusions; he thought, however, that, besides the geometrical theory of the stereoscope, it might be possible to obtain effects analogous to stereoscopic effects by operating in a different manner, and it would be interesting to see stereoscopic effects produced by identical images placed on the two sides in such a way as to satisfy geometrical rules. He considered M. Hermagis's reasonings to be not absolutely correct according to the principles of physics, but his experiments were not the less worthy of mention.

M. Humbert de Molard presented an apparatus constructed by M. Relandin with the object of preserving nitrated papers for a lengthened period. This apparatus contains no preparation, and consists simply of two rollers, around which a piece of linen is wound, and in which the papers are enveloped.

M. Pesme presented, and worked, a machine for cleaning glass plates, constructed by M. Richardin. It is capable of cleaning as many as 500 plates a day.

M. Gérard presented a stereoscope which differed from the ordinary ones, in being capable of receiving glasses of different colours behind the glass slide, which, by means of a double frame, could be raised and lowered so as to give any tint to the picture which might be desired.—*Condensed from the Bulletin of the French Photographic Society.*

Miscellaneous.

Caution on the Employment of Transparent Positives in the Magic Lantern.—Some four years ago we were staying at a friend's house in the country for the purpose of spending a part of the Christmas vacation. Among other things introduced for the amusement of the children, was of course a series of dissolving views. At the conclusion of these there was a slight pause, and then there suddenly appeared on the screen the figure of a young man, with a most ghastly expression of countenance, evidently a victim of consumption. The expression was so truthful and vivid, that we saw at once it must have been produced by the insertion of a transparent positive in a camera through which light was transmitted. There was scarcely time for us to remark to my neighbour on the exceeding bad taste of the person who had done this, when we were startled by a succession of dreadful screams which rose in the darkness. A light was brought, and it was found that a young lady was in strong convulsions, which were followed by an illness from which she did not recover for many weeks. It appeared that the person represented on the screen had been known by her, as well as by many others of the company, in his lifetime; and from the impression made on her, it seems probable that she must have been more attached to him than any one besides herself was aware. It is such a source of amusement to most people to see portraits of themselves and friends reproduced in this way, that we have recommended it as a source of amusement for winter evenings; but, at the same time, we would strongly advise young photographers who may adopt it to confine their efforts to the representation of living individuals.

Facsimile "Hamlet."—A curious and interesting application of photography has been recently made, to the reproduction in facsimile of the margin copy of the first edition of Shakspeare's "Hamlet." This facsimile was liberally ordered, at the expense of the late Duke of Devonshire, for multiplication of the copy to the extent of forty examples, with a view to their circulation among the great libraries of the country, and those of a few favoured private individuals. The text was transferred by photography to stone, and Mr. Netherclift undertook to translate it from the stone to paper. As a facsimile each copy is perfect.—*Art Journal.*

Photographic Identification of a Murderer.—On the 11th Nov., 1854, at Retiers, a man named Lefeuvre, a carpenter, shot and killed a woman whom he suspected of poisoning his dog. He immediately afterwards fled, and was condemned to death, *par contumace*, on the 22nd May, 1855. A few days since, a man was arrested as a vagrant at Rodez, and as he refused to give his name, the aid of photography was called in, and a number of portraits of him were sent to different police stations. One of them happened to reach Retiers, and was soon recognised as the portrait of the murderer who had so long evaded justice.

Photographic Notes and Queries.

COLOURING GLASS POSITIVES FOR THE MAGIC LANTERN.

SIR,—A correspondent, William Cochran, of Glasgow, in last week's "NEWS," asks for a receipt to colour glass positives for the magic lantern.

To accomplish this properly, so as to preserve all the delicacy, sharpness, and detail of the positive, is a valuable secret, the knowledge of which I am very happy to be able to impart to him.

1. Place the glass to be coloured before a candle or window.

2. Mix a few drops of spirits of ammonia with transparent oil varnish, and with the following transparent colours, using a fine soft sable brush :—

For Black —Use ivory black.
White —Leave the glass uncoloured.
Brown—Use burnt sienna ; or, mix lake, gamboge, and Prussian blue.
Orange „ lake and gamboge.
Purple „ lake and Prussian blue.
Red „ rose carmine or lake.
Green „ Prussian blue and gamboge.
Blue „ Prussian blue.
Yellow „ gamboge.

3. Remember to procure powdered transparent colours and oil varnish from a good colour maker or a varnish manufacturer, explaining, at the same time, the purpose you require them for. The colours and varnish are to be well rubbed down on a marble slab.

4. Fill up the background with ivory black, and use the varnish to moisten it with.

5. Do not varnish the glass to be coloured first.

6. Use varnish in quantity according to the depth of colour required, and for that purpose only.

7. Try *dabs*, with a brush, on a piece of glass, to test the depth, transparency, and quality of the colours, before commencing.

8. If too opaque, add more varnish and spirits of ammonia—two drops to about a teaspoonful of the varnish. I can produce a clear reflection on any white screen equal to the finest stained ruby or cobalt glass.

If any further difficulties arise, which I respectfully submit will not be the case if proper attention is paid to the rules before laid down, yourself, or any other person, may reckon on my endeavours to clear them away.

HARRY BELLINI.

[We shall feel greatly obliged if our correspondent will forward some further particulars on the other subject mentioned in his letter. It would be also very important if we could be favoured with a specimen of the results, or an address, where we could communicate with him on the subject.—ED.]

TONING PAPER POSITIVES WITH BICHLORIDE OF PLATINUM.

DEAR SIR,—Some three or four years ago I tried the bichloride of platinum for colouring pictures in the place of gold, and I thought that the balance of advantages was in favour of the latter. I have preserved no specimens, and can only speak from a general recollection that, besides working slower, a larger quantity was required to produce the same effect—thus nearly equalising the cost. On the whole, I did not find any sufficient advantage to induce me to continue its use.

The best practical method of colouring albumenised prints then known, was by adding the gold or platinum to the hypo. bath, and this was the only form in which I tried it. Perhaps, in the better colouring baths since introduced, its effect might be somewhat different. The resulting colour was much the same as that produced by gold; and, as the permanence is probably equal, the only question was one of economy.

I also tried, at the same time, and in the same manner, the perchloride of iron. This also produced a good colour (probably due chiefly to sulphur); for this reason I never used it in practice. One would think, that not a few of the pictures now sold—particularly stereoscopic—must be coloured in some such way, otherwise I really cannot understand how it is that so many of them fade with such rapidity. I have, myself, in time past, employed very bad processes, such as I should not now think of using; and although the lights of some of my older pictures have turned very yellow, scarcely one of them, so far as I am aware, has faded, in the proper sense of the term. I have always been particularly careful about the washing, and perhaps it is to this that my good fortune is owing. Nothing can be more slovenly than the way in which I have seen it done, and that too by operators who ought to have known better. It is unfortunate for honest printers that, in general, the appearance of a photograph affords no clue to the process by which it was taken and coloured, nor to the sufficiency of the washing.

I have no doubt that an ordinary positive print, toned with gold by any of the recent processes, and carefully washed, may be considered quite permanent. I do not despair, however, of some cheaper and quicker way being discovered. The ink process is a step in the right direction; but any one who will look over a bundle of old letters, will see great reason to doubt whether a picture in gallate of iron is more permanent than an ordinary silver print.

W. R. SEDGFIELD.

GLASS DISHES.

SIR,—A few weeks since you did me the favour to insert a letter on "Photographic Desiderata," which appears to have induced several gentlemen to communicate to your columns various modes of making and cementing glass dishes. Admitting these built dishes, as they are technically called, remain perfectly sound and water-tight for many months or years, they all still possess the following serious defects, viz., that the line of junction of the sides and bottom, *almost* microscopic though it be, is *rough;* and, as long as the dish is only used for silver solutions, no harm ensues; but if used alternately for exciting and developing waxed paper, for instance, decomposition and turbidity of the respective solutions speedily inform the manipulator that his dish was not chemically clean before using. The manner in which the sides of most built dishes are attached or cemented to the bottom, is most objectionable, viz., at an acute, or right angle, the dirt which lodges at the apex of the angle, represented by the *rough line* of cement, being removed with great difficulty, and a small quantity of old gallo-nitrate too frequently remains. If good moulded glass dishes could be procured, whose sides sprang from the bottom in a curve, and possessing no corners or angularities; and if measures and developing glasses had the "punty marks" properly ground off and polished, the "washing-up days" of photographers would be bagatelles, and not the fatigues and bores they are at present.

GEORGE EDDOWES.

THE COLLODIO-ALBUMEN PROCESS.

DEAR SIR,—In reply to your correspondent, "An Amateur," the *collodion* should be iodised and sensitised in the collodio-albumen process, otherwise it is very much slower in the camera, and also in development; many persons have tried all possible variations in order to simplify this process, but I think in all instances the results have been inferior. The modification your correspondent mentions, of washing off the albumen, has been tried here some time ago; the objection to it is, that in large plates it is impossible to wash off the albumen evenly; the same result can be obtained by

reducing the prepared albumen with water, and so leaving a smaller amount of albumen on the plate, but I think in general the old proportion of albumen to water gives more satisfactory negatives. J. SIDEBOTHAM.

Manchester.

ANSWERS TO MINOR QUERIES.

PREPARATION OF IODIDE OF AMMONIUM.—*Chuck*. Many methods have been from time to time recommended for the preparation of this salt, but the best in our opinion is the following:—prepare iodide of iron first by heating together 5 parts of iodine and 25 parts of water, into which are gradually added 2·5 parts of iron filings; when the iodine has all disappeared, filter and add carbonate of ammonia until a precipitate no longer falls; then pour the whole into a filter and wash once or twice; collect all the clear filtrates together into a dish, and evaporate by a gentle heat till the salt crystallises out. It must be kept in a well stoppered bottle in perfect darkness.

COTTON-WOOL BRUSH FOR THE CALOTYPE PROCESS.—*Paper*. We believe these brushes were first suggested by Mr. Buckle, at all events they bear his name, being known familiarly as Buckle's brushes. They are made by taking a glass tube, from two to six inches long and half an inch in diameter, and forcing a tuft of perfectly clean cotton wool into the end, so that sufficient remains projecting to be used as a brush. The tuft should fit sufficiently tight in the tube for there to be no danger of its coming out in use. We have found a good plan to avoid the possibility of this happening is, to tie a piece of silk thread round the middle of the cotton-wool, and with that *draw* the tuft into the end of the tube.

GLAZE FOR COLOURED STEREOGRAMS.—*A Subscriber*. The plan adopted by several of the most popular artists is, to have the slides rolled between steel cylinders after they are coloured. This gives them a gloss without in the least injuring the colours.

SUBSTITUTE FOR GROUND GLASS.—*S. S. B.* A correspondent has informed us that the most simple substitute for ground glass is thin starch paste poured over plain glass, and then allowed to drain and dry spontaneously.

PREPARATION OF PROTO-NITRATE OF IRON.—*Positive Photogram.*—Dilute 9 parts of strong nitric acid with 30 parts of water, and when cold, add to this, in a flask, 8 parts of pure iron wire. Place in cold water, and allow it to stand all night, agitating now and then. When required for use, add one-third of a drachm of glacial acetic acid to every ounce of solution. This will keep for many months in a well-stoppered bottle, and will be found an excellent developer for positives. Another very good formula is the following:—Dissolve 1,600 grains of nitrate of baryta in 45 ounces of cold water, and 2,000 grains of crystallised sulphate of iron in 15 ounces of cold water. Mix three parts of the former solution with one part of the latter, filter or decant from the sulphate of baryta, and add half a drachm of glacial acetic acid to every ounce of the solution.

TO CORRESPONDENTS.

☞ Some complaints having been made by our subscribers as to the non-receipt of the "PHOTOGRAPHIC NEWS," the publishers beg respectfully to notify that every care is taken on their part to insure punctual and correct dispatch. All complaints should, therefore, be made to the Post Office authorities.

We must beg our correspondents not to send glass plates through the post, except they are securely protected against breakage.

HARRY BELLINI.—Will our correspondent oblige us with an address where we could communicate with him. We shall be very happy to receive the particulars and papers referred to.

F. H., Newcastle-on-Tyne.—We are engaged in organising a plan, by which what you propose can be very satisfactorily accomplished. In the meantime, we would suggest the advisability of your inserting a short advertisement in our pages.

A HARD WORKING AND PRACTICAL AMATEUR.—Received with thanks.

S. S. B.—The best plan for you to adopt to obtain nitrate of silver from the powder and solution which you have at present, will be to add excess of carbonate of soda, evaporate to dryness, and mix with four times its weight of dry carbonate of soda. Then fuse in a crucible as recommended in our last number, and you will obtain a button of metallic silver. Your suggestion is a very good one, and we will at once proceed to carry it out; we hope to be able to commence in our next number.

G. L. G.—If you will forward to us a specimen of the crystal you obtained, we shall be able to tell you what it is. We should also like to see the kind of effect you say it produces on glass positives.

R. W.—1. Yes. 2 and 3. We regret we cannot answer.

LATENT.—1. Collodion of a dark colour is generally less sensitive than when it is paler. The colour is due to iodine; which can be removed by adding a few grains of metallic cadmium. 2. What developing solution do you refer to? 3. If kept in a *well* corked or stoppered bottle, spirits of wine will retain its strength for any length of time. 4. Amber varnish will do for both positives and negatives. 5. There must have been some impurity in the gutta percha vessel in which you placed your bath; probably hyposulphite of soda, or developing solution. 6. Soak it for some hours in a strong solution of cyanide of potassium, and then rinse in dilute nitric acid. 7. Your ground-glass is too coarse. Procure some prepared especially for focussing, under the name of grey glass.

K. X.—1. Of course the upper tub must be pushed sideways; so as to allow the tap to be over the lower one. 2. Yes. 3. At any chemist's.

T. W. HOWARD.—We have a letter for this gentleman; where shall it be sent?

F. W. T.—We cannot give you a fuller account of the formulæ, &c., required in the negative collodion process, than will be found in our "Catechism." We are much obliged for the information contained in your letter.

A. U. T.—Use a 100-grain solution of nitrate of silver for exciting the paper by; and keep longer in the gold bath.

J. GREENHALGH.—The cotton you enclosed is the right kind to be used in making pyroxyline.

W. H. W.—Your letter has been forwarded to Mr. Woodward.

J. M.—We have forwarded to your address a note; which will give you the desired information.

R. M. S.—1 and 2. We can only answer by referring you to our back numbers. 3. The formula you ask about is given at p. 12. 4. We cannot at present answer. 5. The diameters are somewhere *about* 1⅝, 2¼, and 3¼-inches; but they vary with different makers.

PHOTOGRAM.—We will inquire; and answer our correspondent in our next number.

THETA.—It requires a bright summer's sun to carry out the experiments which we contemplate performing with the new metal junonium. We do not know where the error lies in your toning process. Will not the gold solution darken it if kept in longer? The *quasi* Editorial article addressed to that unfortunate young photographer is all nonsense. Acetic acid in the bath *is* a great improvement; and helps very materially to keep the whites clean. You cannot do better than persevere in the formulæ given at p. 86.

W. R. R.—We do not think you will meet with as much success with the "paper-glass" as with gelatine paper. We will give the other information required shortly.

ANNIE.—Fine thin paper, such as is prepared for photographic purposes, will answer best. Black japan can be obtained of a varnish maker or coach builder. We are happy to think we have earned such golden opinions from you.

PHARO.—We are not aware that reticulation of the film is owing to the silver bath not being strong enough. Water in the collodion is the most usual cause.

A SUFFERER.—The poisonous properties of commercial cyanide of potassium are not by any means dangerous if ordinary care be taken.

C. C.—A good landscape lens will not cause buildings to appear to fall forwards if you take care to keep the camera perfectly horizontal. If you send an address, we will communicate with you on the other matters.

F. C. D.—1. *Plain* paper only should be floated on the albumen solution. 2. About half an hour. 3. The pictures you allude to were taken by employing a perfectly black background behind the sitter, and then backing up with chocolate-coloured paper.

BROMMELL.—1. Good portraits cannot be taken in a room lighted with only one window in the way you name. A sky-light will be a better addition than another window. 2. The time of exposure will depend so much upon the quality of the lens and collodion, that nothing but experience will enable you to judge; you can, however, try five minutes to commence with.

UN ELEVE.—A little more or less than the specified quantity of protosulphate of iron in the developing solution will not be of any material consequence in the result. Nitrate of iron is used by some photographers; we have given the method of preparing it. Glacial acetic acid is to restrain the too energetic action of the developer. More is required in summer than in winter. Your other queries we cannot at present answer.

R. WILSON.—A wooden frame can easily be contrived, against which prepared plates can rest against the wall to dry. When dry, they should be stored away in tin boxes. We hope to be able to give information on the other point by our next number.

CHESHIRE JOHN.—You had better procure a half-plate portrait lens, and a single stereoscopic lens.

T. BOLLINS.—We hope to be able to give you the desired information in our next number.

J. A.—1. Except in very open and well ventilated places, all stoves in which gas is used for heating purposes should be supplied with a flue to carry away the noxious products of combustion. 2. The collodio-albumen process, in our opinion, is superior to Fothergill's.

G. S.—The prints look as if the sensitive paper had been kept too long before being used. They have not remained long enough in the gold bath.

R. T. B.—1. Protosulphate of iron. 2. Not so good as some we have published. 3. Soak it for some days in strong solution of cyanide of potassium; and then, after rinsing, for a few hours in dilute nitric acid. 4, 5, 6. Very little is known about the peculiar properties and requirements of acid or alkaline collodions; we are, however, inclined to answer these questions in the affirmative. 7. Consult previous numbers. 8. Wash it well with dilute sulphuric acid, and then with pure water, and the silver will be pure enough.

A. NOVICE.—1. In an early number. 2. In front of the lens.

AGATE.—Well washed in cold water.

Communications declined with thanks:—F. R. S.—A Dabbler.—James F.—Thomas.—N. O. B.—Stereogram.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "PHOTOGRAPHIC NEWS:"—January.—W. A. L.—G. M.—Letter Box.—J. S.—Taper.—Ars Longa.—Aplanatic.—A Subscriber from the First.—Blotting Paper.—W. W. W.—S. E. A.—Q.

IN TYPE:—H. F.—H. D.—H. C.—A. D.—X.—M. D.—A. E.—M. C.—A London Firm.—W.—An Amateur—S. T.—T. H. C.—H. D.

On account of the immense number of important letters we receive, we cannot promise immediate answers to queries of no general interest.

*** All editorial communications should be addressed to Mr. CROOKES, care of Messrs. Cassell, Petter, and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

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PAPER *versus* COLLODION.

BY M. VERNIER, JUN.

SINCE the discovery of collodion, the paper processes have almost gone out of practice, and that for good reasons. Collodion acts more quickly, and gives clearer pictures: nevertheless, if two positive proofs be taken of the same landscape, the one obtained by means of collodion, the other on negative paper, it will be remarked that the one taken on paper is richer, softer, more aërial, and deeper, in short, more artistic than the other. This difference of results induced me to make fresh trials with paper, with the object of obtaining the sharpness and rapidity of collodion.

The method I am about to submit to the consideration of your readers will, I hope, have the result of restoring the negative paper to the position it originally held among photographic processes. As the basis of my experiments, I selected gelatine as used by one of the ablest of photographers, M. Baldus; this substance does not alter the silver bath, but allows it to retain all its limpidity. Following his method, I obtained more sharpness by sizing the paper before iodising, and greater rapidity by immersing it in an ethereo-alcoholic iodide bath before submitting it to the silver bath; beside these two operations, which are over and above M. Baldus's process, I develop the picture with sulphate of iron, which, as is generally known, is the quickest developer. The method I employ may be briefly described as follows:—

I choose a paper, the substance of which is very equal, and mark one of its sides with a pencil; I then float it for a minute or two on the following substance—rain water, 1000 parts, gelatine, 15 parts; after which, I take it out, and dry it by suspension. I prepare a considerable number of sheets in this way; and when they are dry, I collect them, and put them in a blotting book, which I then put under the press until the following day.

Iodising.—If the gelatinous substance, which served for the sizing of the papers, is still sufficiently attenuated, I add to every hundred parts of liquid—iodide of potassium, 3 parts, bromide of potassium, 0·6 parts; I dissolve with the aid of heat, and strain the whole through a cloth, and then pour it into a dish, which is kept warm by being placed over a stove. I then treat my papers with this solution in the same manner as on the preceding evening, taking care that no bubbles of air form beneath them, and I also place them on the solution with the marked side downwards; after drying, put them away in a box in a dry place. This double preparation gives great clearness and delicacy to the proofs; renders the paper unalterable; preserves its whiteness; and prevents it from ever becoming spotted—the reason of which is easily understood, the iodine not being in contact with the body of the paper, which often contains various kinds of substances capable of neutralising it in places, and producing, after the development of the picture, a greater or less number of little spots, which disfigure the picture in an irreparable manner. The preliminary sizing is therefore of incontestable utility.

Sensitising and *exposure.*—To use this paper, I take it by an angle, by means of a small iron hook coated with gum-lac dissolved in alcohol, and immerse it in a bath, composed as follows:—Ether, 25 part; ordinary rectified alcohol, 75 parts; iodide of potassium, 0.5 parts; the paper imbibes it instantaneously. If I want it for dry purposes, I remove it, and suspend it until dry; in the contrary case, I lay it at once, face downwards, on the silver bath used for collodion negatives; after a contact of two or three minutes, according to the temperature, I remove it, and place it immediately in the negative frame for exposure. The time of exposure is very nearly the same as for collodion; nevertheless, I must observe, that a silver bath, strengthened with acetic acid, renders the paper *more* sensitive. In all other processes this acid retards the luminous impression, while the very contrary results in this case; the acid opens the pores of the gelatine, swells it, and, consequently, renders it more permeable to the chemical action of the light.

Development of the picture.—When the exposure has been sufficiently long, I plunge the paper in water mixed with alcohol; I then extend it on the solution of sulphate of iron, as used for developing collodion. The image speedily appears in all its details; if it is wanting in vigour from insufficient exposure, I allow the paper to drip; spread it on a glass plate, and pour on it, commencing at one of the angles, a weak solution of nitrate of silver, and then pass it a second time on the sulphate of iron. This simple method of strengthening it, suffices to give the negative all the intensity desired.

It will be seen that, when one has a plentiful supply of iodised papers, the manipulations are very simple, requiring but little time, and no complication of new baths; but the especial advantage that this bath presents is, the facility with which one obtains very good proofs by the dry method. To return to what I said above relative to the paper, which I dried by suspension on taking it from the ethereo-alcoholic iodide bath. This desiccation of the paper is not absolutely essential for the dry process. I point it out, because I find it gives greater facility in working. I generally prepare eight or ten sheets; when I am doing the last, the first, well drained, is ready for placing on the silver bath. After the two washings, which must follow the sensitising of the papers, the other operations are the same as in the wet process.

I one day exposed two papers in succession, on each of which I took the same picture, one I treated with sulphate of iron, the other with gallic acid; the former developed rapidly, and gave me, as usual, a good negative; the latter, submitted to the reducing bath of gallic acid, after half an hour's immersion gave no sign of a picture. Being convinced that the paper had been acted upon, the exposure having been the same as in the other case, I strengthened the bath with some drops of nitrate of silver, and waited an hour to see the result, but still no picture. Finally, vexed at finding it would not come out, I took a bottle containing an old nitrate of silver bath, which I had used formerly in different experiments; it contained ether, alcohol, iodides, acids, and a little sulphate of iron. I decanted the clear part of the liquid, and poured a considerable quantity of it in the gallic acid solution. I then went on with some other work, and left the proof to itself. An hour afterwards, on going into my laboratory, I was greatly surprised to see the picture perfectly developed; but what astonished me most was the fact, that the reducing bath had undergone no alteration. What was the substance in the old bath which preserved the gallic acid in good condition?

There is another question to which I will attempt to give an answer:—Why is collodion more rapid than all other films used in photography? Does this rapidity arise from the pyroxyline employed in its composition, or is it due simply to the two substances in which it is dissolved?

Without pretending to give a positive opinion on this sub-

ject, I believe it must be attributed to the ether and the alcohol combined. In fact, I have just shown that these liquids, by imbuing the paper instantaneously, facilitate the combination of photogenic products, and, consequently, open a more free access to the chemical action of the light.

THE MOLECULAR ACTION OF CRYSTALLINE PARTICLES.*

BY DR. A. WELLER.

The fixation of the mercurial vapours in the daguerreotype process which has excited so much interest, and for which so many theories have been advanced, is but another example of the force which causes the deposition of solid and gaseous particles from a liquid, and which produces so many other effects. In this case the chemical rays of light act in the same manner as mechanical action and caloric in causing a certain molecular disturbance. By the discoveries of Möser it is shown that these rays possess the power of acting upon almost any body, in such a manner as to render it capable of fixing the particles of various vapours. Thus simple minerals, glass, &c., may be made to fix the mercurial vapour. It appears, however, that silver, gold, copper, &c., which form amalgams, or, in other words, are capable of being wetted by mercury, possess this property in a greater degree than any other bodies which are capable of being wetted by it, in the same way as we have seen that glass has the greatest power to fix the vapour of water. Admitting the truth of this theory of the daguerreotype process, we are naturally led to inquire whether the same agent may not likewise cause the fixation of particles in a state of solution or of vapour, in the same manner as by simple mechanical action. After several unsatisfactory attempts I finally succeeded in clearly proving this fact. The solution which shows the influence of light the most evidently is that of the neutral chloride of gold. A few grains of this salt dissolved in an ounce of water, when exposed to the light, deposit minute crystals of a metallic appearance on that side of the glass nearest the light. The action of light in causing the deposition of gaseous vapours may be shown by placing some iodine in a bottle closed with a glass stopper. After being exposed in the sunshine for several hours minute black crystals will appear on the side nearest the light, which will change their position according to the side of the glass exposed. Another substance which shows the action still better is camphor; a piece of which, merely covered with a glass shade, will give rise to a crystalline deposit after an hour or two of exposure to light, which presents the same phenomena as those of iodine. By a prolonged exposure these crystals become very abundant, and very beautiful. I have applied this property to the construction of an instrument for measuring the chemical rays of light. As the details would be foreign to our present subject, I will defer them to another occasion, and confine myself now to prove that these phenomena are independent of the deposits caused by radiation.

1st. The crystals are formed on the side exposed to the action of direct or diffused light.

2nd. They are not formed during the night, when the radiation of the earth is sufficient to cause the deposition of water.

3rd. Green glass, which retards photographic action, likewise impedes this deposit.

In an experiment which is now going on, a bottle of pale green common glass is exposed to the north, while another of white glass is placed in a southern aspect. The first became covered with minute crystals, in size averaging about a millimètre, which have remained stationary about a week; the second is covered with arborescent ramifications, which are daily increasing. Several familiar, but hitherto unexplained phenomena, may, in my opinion, be easily accounted for by these molecular actions. The formation of hail I consider to be an instance of an action precisely similar to that which causes the deposition of the solids of gaseous and liquid particles. If we admit the influence of this force on the globular vapours of water, it is not at all improbable that certain conditions may arise in nature when these vapours may be much more liable to this influence than we find them in our imperfect experiments. We have seen that a solution of sulphate of soda or water in a pure state may be brought by the abstraction of caloric to such a condition of unstable equilibrium, that the slightest perturbating cause will immediately reduce it to a solid form. If we admit that the globules which form the clouds are capable of being placed in a similar condition, we have sufficient data to explain all the phenomena that occur in the production of hail. Any nucleus formed within a cloud of this state would create around it a deposition of all the neighbouring particles, and the size of the hail-stones would be dependent upon the thickness of the cloud they had to traverse. In the storm of Ordenburgh, in 1825, mentioned by Dr. Eversman, pyrites were found in the centre, and had acted like a nucleus round which the crystallisation had taken place. Where the centre is not formed by a foreign body of this sort, it has frequently been mentioned that it consisted of an opaque nucleus of a spongy nature, like congealed snow, which may be easily accounted for. The succession of concentric layers would be caused by the passage of the particles through strata of liquid globules not all at the same temperature, and the radiated structure indicates a gradual increase of crystalline action proceeding from the centre. The temperature of the hail-stones, which has generally been found below the freezing point, is a further corroboration of this view. The formation of butter is likewise, in all probability, another instance of molecular action of the same nature. It is well known that after the cream has been agitated for a certain length of time the globules suddenly coalesce, and by their union butter is produced. The sudden appearance of this product is the more remarkable, as it takes place at different temperatures, although more quickly at some than others, and not gradually, as might have been expected, which precludes the idea of its being owing to any caloric developed by friction. The most minute observations have been unable to show any material alteration in the appearance of the fatty globules at the moment before the butter is formed. Little doubt can be entertained of its being caused by some molecular action, engendered in the globules by the continued agitation they have undergone. Some of the most permanent gases likewise exhibit phenomena closely allied to the above, by their action on platinum and other metals. According to Dulong and Thenard, platinum foil newly beaten has the property of acting at the common temperature on a mixture of hydrogen and oxygen, but after a few minutes' exposure to the air it entirely loses that power, which may, however, be restored to it in a stronger degree than before by heating it in a covered crucible. If it be kept in a covered vessel, so as to exclude the air, it will retain the power without decrease for four-and-twenty hours. Platinum filings, made with an ordinary sized file, have the same property immediately after their formation, which they retain for above an hour. It has also been observed that a hollow ball of platinum has the power of condensing and absorbing different gases, which are generally disengaged at a temperature below the boiling point (Pouillet, *Elemens de Physique*, § 131). The action of the gases on platinum in all the above cases greatly resembles that of carbonic acid on glass, except that not merely simple lines, but the whole surface of the metal exerts its influence, and that the gases themselves are invisible.

* Continued from page 198.

NOTHING NEW UNDER THE SUN.

In the notice of the meeting of the French Photographic Society in vol. i. p. 250, we stated that an apparatus for the preservation of sensitised paper had been designed by MM. Davanne and Girard, and manufactured by M. Marion;

we at the same time mentioned that M. Frank de Villecholles had asked a question relative to a similar box invented by M. Cognacq. The latter gentleman has addressed the following letter to a foreign contemporary, on the subject:—

"I READ in the bulletin of the French Photographic Society that M. Marion had presented an apparatus for preserving positive papers. I have likewise read the article of MM. Davanne and Girard, in which I observe that they advise the use of chloride of calcium as a proper substance for preserving nitrated paper.

"Without disparagement to MM. Marion, Davanne, and Girard, it was I who first discovered the properties of chloride of calcium as a preservative substance. In the month of May last I had the honour of addressing you a letter" (the letter was not received), "in which I informed you that I had discovered a means of preserving nitrated paper; it is true that at that time I did not consider it advisable to indicate the use of chloride of calcium, but it is very easy to ascertain now, that the various apparatus sold to MM. Aguado, Collard, De Vuillefroy, Gabriel de Kumine (Rumine?), and others, do not contain anything beside chloride of calcium.

"I hope you will receive this protest, which will be the last. It is sufficient for me to have proved, in a decisive manner, that the priority of this discovery cannot be contested with me.—Agréez, &c., H. COGNACQ."

[In support of this letter, Messrs. L. and H. Wulff addressed a letter to the Editor of the *Revue Photographique*, in which they stated that a description of the apparatus was published in his paper and in other journals in June of last year; and that they had delivered several of these boxes to men of mark among photographers. They state further, that last October M. Marion sent to them for one of these boxes for a M. Dol, of Cagliari, and the box was accordingly sent to him, together with a bottle containing the chloride of calcium. This box and bottle were returned to them a few days later by M. Marion, with an intimation that he was not quite satisfied with the apparatus, and begged them to forward it direct to M. Dol.

They add to their letter certificates from well-known photographers, stating that they had purchased similar apparatus of them some months back.

The *Revue* winds up the publication of the letters by stating that Messrs. Davanne and Girard have discovered the properties of chloride of calcium too late. We shall no doubt have an early opportunity of forming an opinion on the subject in dispute; meanwhile we may state that we have been shown one of the cases manufactured by M. Marion, though, of course, we have not yet had an opportunity of testing its merits; but judging from appearance, we see no reason to doubt that it will answer the purpose for which it is constructed. As to the degree in which it may resemble the apparatus of M. Cognacq we are not in a position to speak, inasmuch as we have not yet seen the latter.—ED.]

M. NIEPCE ON THE PRESERVATION OF LIGHT.

THE following are the directions given by M. Nièpce de St. Victor for obtaining photographs by means of light stored up in tubes.—*Cosmos.*

"Use paper prepared with ammoniacal chloride of silver, as it is more sensitive than that prepared with chloride of silver alone.

"At the moment of opening the tube, a little water must be inserted inside in such a way as to well moisten the pasteboard, and any water not immediately absorbed must be allowed to run out; and the tube again closed, and heated over a spirit lamp until it has reached a temperature too high to be borne by the naked hand (about 150 degrees), then opened directly, and applied upon the thin paper bearing the engraving, which serves as a negative, and the results will be the reproduction of the engraving on the sensitive paper beneath.

"The pasteboard ought to be strongly impregnated with tartaric acid, and insolated for four or five hours in the month of July. Pasteboard impregnated with nitrate of uranium does not require to be insolated above an hour; but it loses the acidity communicated by the light much more rapidly."

M. Plumier has informed us that the best sensitising liquid for preparing the paper for these experiments is composed as follows:—Dissolve 12 parts of nitrate of silver in 100 parts of distilled water, then add ammonia drop by drop, and at the same time shake the solution until it is dissolved. The solution is at first brown, but eventually becomes perfectly limpid: it is advisable to boil it for some minutes to restore it to a neutral state.

COMMUNICATION FROM THE FRENCH PHOTOGRAPHIC SOCIETY.

WE have received a communication from M. Martin Laulerie, the Secretary of the French Photographic Society, written, apparently, under the impression that we have not informed our readers that it is the intention of the French Society to hold an exhibition in the ensuing month. We need scarcely remind our readers that we announced the fact some weeks since, and that we have subsequently given all particulars published respecting it, including the rules intended to regulate the exhibition. Rule 2 has been since modified, as will be seen on reading the annexed translation of a letter, which appears to be an appeal to photographers individually. We may add that we sincerely hope the appeal may be successful in inducing a good number of English photographers to sustain our national credit.

"Sir,—I have the honour to remind you that the third public Exhibition of the French Photographic Society takes place, this year, from the 1st April to the 15th June, at the Palace of Industry, in a place specially set apart for it, and concurrently with the exhibition of paintings. The committee invite all photographers, whether native or foreign, to send photographs, in order to give this Exhibition the importance and interest of a really universal Exhibition, which will allow of a correct estimate being formed of the progress of the art in different countries.

"Although the regulations of the Exhibition have been already published in the monthly bulletin of the Society, the committee consider it advisable to remind you, personally, that objects intended for exhibition must be forwarded to the Secretary, M. Martin Laulerie, 11, rue Drouot, Paris, between the 1st and 15th March next.* As the jury, appointed to examine the works sent, meet on the 20th March, the committee have been obliged to fix the date of the 15th March* as being the latest for receiving proofs.

"If, sir, it be your intention to take part in this Exhibition, I beg you, in the name of the committee, to let me know as soon as possible, without waiting until you dispatch your parcel.—I have the honour, &c.

"MARTIN LAULERIE."

DISCOLOURING OF THE SILVER BATH.

BY H. FRANCIS.

DISCOLOURING of the silver bath in which albumenised paper has been prepared, is a constant complaint among photographers. Kaolin is generally recommended, and answers very well; but is not readily to be got even in London. We have had in use for some years, common pipe clay, which answers as well as kaolin, is much cheaper, and can be got in any part of the world. After we have prepared as much paper as required, we return the silver solution into a large bottle, which has about a pound of pipe clay in it, shake it well, and leave it to settle for the next day's use, when it will be found quite colourless. We would also recommend those who are in the habit of

* A delay of twelve days is accorded to foreign artists who shall give notice of their intention to exhibit *previous* to the 20th March next.

doctoring up a spoilt negative bath, to at once make a new one, and throw the spoilt one into the paper bath with the pipe clay, as we find it answers for paper as well as a new bath, of course adding a little silver to make up the difference between the strength of the two baths.

Critical Notices.

Stereographic Views of Chatsworth. By Mr. Poulton.

The idea of putting Chatsworth into the stereoscope is an exceedingly happy one, and considering the gorgeous magnificence of the grounds and the beauties of this "Palace of the Peak," we think it ought to be done in the best manner. We happen to know that in the summer of 1857 the duke contemplated thus illustrating his palace for the purpose of private distribution, and had he lived no doubt he would have carried out his idea, but death removed him ere he could accomplish the task of placing in the most unique of all modern instruments that most princely of all mansions, the Palace of the Peak, to which his own good taste and kingly magnificence contributed so much in making it what it is. Chatsworth may be considered as the finest of all the seats of the English nobility, and in looking at the views which Mr. Pulton has executed, we can form a pretty good idea of the extent and beauty of this place. As we look at slide after slide we are forcibly struck with the similarity which exists between many of the views and the Fairy Garden and Palace at Sydenham. In both we see the traces of the master hand who designed them. The view of the "Portland Walk" in the Ornamental Gardens could easily be passed off as the entrance to the Crystal Palace. As to the generality of these slides, we are sorry we cannot indorse the opinion expressed by the publisher that, "all who have seen these slides (which delineate scenes in this most beautiful of England's seats) have pronounced them to be of a very high order." We heartily concur in our approval of the expression that Chatsworth "is the most beautiful of England's seats;" but that the slides are of a high order we cannot allow. In the selection before us there are few "scenes;" they mostly comprise floral and botanic studies, without the necessary accompaniment of colour; and any one who would purchase this series in the hope of securing happy recollections of pleasant scenes would be sadly disappointed, because they chiefly consist of views of the most uninteresting kind. They are bad as photographs, and as artistic selections much worse.

Practical Photography on Glass and Paper. A Manual containing Simple Directions for the Production of Portraits Views, &c. &c. By Charles A. Long.

If the law of supply and demand be applicable to the production of elementary photographic treatises,—and we see no reason to doubt it—then, indeed, must the demand for photographic works be great, as the supply keeps up, and every few weeks we have to notice a new face in the field.

Of the work before us we are somewhat at a loss to say much. It is termed a manual of "practical photography," and as such we do not exactly see in what hands it can be most useful. The hints which it contains are by no means new to any one who is himself a "practical photographer,"—therefore it can be of no possible use to any one who has a knowledge of the manipulation of the positive and negative processes; while to the amateur it is scarcely adapted, as there is too profuse an interspersion of technicalities.

Moreover, although this is announced as the "fourth edition," there does not seem to be that amount of sequence of thought which is so requisite in a work which simplifies any art. It is evidently the production of one who has a good knowledge of photography, and all the requisites to produce a good picture; but he has not the power to express his meaning in language adapted to the mind of the beginner in the art of photography. For it must be borne in mind that not a few who follow the art of photography, are at the outset quite ignorant of the very simplest elements of chemical knowledge Therefore, a work which is intended to teach such beginners should be as free as possible from the technicalities to which we have alluded. It contains some hints, however, that will be of use even to the "practical photographer,"—not that he will learn much from them, but they may recall some forgotten fact to his mind.

Lessons on Colouring Photographs.

Relations and Harmony of Colour—(*continued*).

We have been speaking hitherto of the more striking and apparent sources of harmony arising out of judicious contrast. Harmony in colouring may, however, arise from various sources, and next to that of contrast the harmony of *analogy* is, perhaps, the most important, comprising as it does an infinity of varied and refined beauties, "too subtle to be defined, too intricate to be easily understood, and often too exquisite to be felt by the untutored eye." The harmonies of contrast are most generally produced by the juxtaposition of the primary and secondary colours, and those chiefly used in some approximation to their full hues. The harmonies of analogy arise from the judicious arrangement of the varied tints and shades of any single colour; from the arrangement of full hues after their natural gradation as seen in the solar spectrum; or from happy arrangement and gradation of tertiary and semi-neutral colours. To the production of good results in this respect, good taste, careful observation, and a cultivated eye are absolutely essential; for in proportion as the effects are delicate, the mode of producing them is less obvious. Of this class of beauties it has been well observed by Field in his "Chromatography," that "they are at once less definite and less generally evident, but more delightful—more frequent in nature, but rarer in common art;" he adds that they at the same time "give a boundless license for the display of the most captivating harmonies of colour, and the most chaste and delicate expressions." On this subject it is evident no definite rules can be given; we have said sufficient to be suggestive of its importance, and to commend it to the careful study of the reader.

Somewhat allied to the last source of harmony is that arising out of the prevalence of any given tone throughout a picture, producing an effect analogous to throwing upon it a coloured light or viewing it through a tinted glass. This effect does not, indeed, come strictly within the true meaning of harmony, although the principles and practice of many good painters, confounding tone with harmony, have at times substituted the one for the other. It has the effect, however, occasionally of reconciling in some degree discordant arrangements of colour. Where the picture is intended to appear suffused by a coloured light, or in other words, where a certain tone is intended to prevail, care must be used that every colour in its own degree shall be properly modified. For instance, if a warm tone is intended to characterise the picture, the reds will approximate to scarlet, the scarlets to orange, and the yellows to orange; the greens will lose some amount of their blue and acquire yellow, the purples will incline to red, and the blues approximate to a warm grey. Thus all the colours containing red and yellow become heightened by the prevalence of orange, which at the same time somewhat neutralises the blues and colours of which blue is a prevailing component. As whatever may be the inherent colours in the model, the painter is always master of the tone which shall prevail, he may often avail himself of this fact to produce pleasing effects, or to neutralise the influence of any mass of unharmonious colour which of necessity belongs to the picture.

The harmonies of contrast are always the most striking and attractive, those of analogy the most subdued and delicate. In portraiture, therefore, where it is desired to give the utmost importance and prominence to the face, the latter class of harmonies should prevail in the accessories. The dominant colours of the complexion being ascertained and reproduced, all accessory effects, whether in draperies or background, should be chosen to give value and prominence to the face by contrast, the harmonies of analogy only prevailing so far as these accessory colours themselves are concerned. If, on the other hand, from any inherent defect or deformity in the model, it is desirable not to give too much prominence to the face, the attention may be drawn from it by the employment of the harmonies of contrast in the

colouring of the accessories. The best effect will, however, be produced by the judicious combination of both kinds of harmony, taking care, in the introduction of accessories for the sake of colour, that they are not incongruous with the character of the picture, and that they are so distributed as to produce a general symmetry and to avoid the spottiness of effect which will easily arise from bad arrangement of minor matters.

The photographer who wishes to excel in the colouring of his productions will do well, whilst acquainting himself with the principles on which harmony depends, to avail himself of every opportunity of studying the works of great painters, and critically ascertaining to what extent and how these principles are carried out. This will be found a valuable method of fixing them in his mind. At the same time let him endeavour to examine and analyse the colours of nature, which imitative art can, at best, but endeavour to reproduce. In speaking of portrait painting, Sir Joshua Reynolds says, "avoid the chalk, the brickdust, and the charcoal, and think on a pearl and a ripe peach." It would have been better, with all due deference to so great an authority, if he had said "think of the natural hue of the human face."

(To be continued.)

Photographic Chemistry.

CHEMICAL MANIPULATIONS—*(continued)*.

Reduction (continued).—We now proceed to the *second process by reduction of the chloride of silver*. All liquids containing silver, but which have no mixture of cyanide of potassium or hyposulphite of soda, may be collected together in a vessel, and hydrochloric acid, or a solution of common salt, added; precipitation will immediately commence, and a heavy white precipitate will be thrown down: the hydrochloric acid, or solution of salt, whichever is employed, must be added in excess. When the precipitation has ceased, the liquid should be left to settle closely at the bottom of the vessel; after which, the clear liquid should be drained off, and the precipitate washed, either on the filter or by decantation, and reduced to a metallic state by one of the following processes:—

1. *By means of zinc and sulphuric acid*, as follows:—Pour on the wet chloride at least double its volume of water, containing about $\frac{1}{10}$th of sulphuric acid; then put in it a piece of thick zinc plate, and leave it there for about twenty-four hours; the chloride of silver is reduced, and chloride and sulphate of zinc is formed, and metallic silver, which will be found in the form of a white powder. This powder is pure silver, and should be washed and filtered, and then dried.

2. *By means of potass and sugar*.—The chloride of silver to be reduced is placed in a flask or a capsule, and about double its volume of dilute solution of caustic potash (1 part of potash to 9 of water), in which a little sugar has been dissolved, is added, and heat applied until the liquid is brought to a state of gentle ebullition. When the blackish powder, which results from this treatment, after being washed in several waters, is entirely soluble in nitric acid, the reaction may be considered at an end. This powder is likewise pure silver.

This latter process does not allow of the gold being recovered at the same time as the silver; a different treatment is required. The residues, containing at the same time gold and silver, should, by means of evaporation, combustion, and calcination, be brought to the condition of ashes, and treated with aquafortis—which is a mixture of 2 parts of hydrochloric acid and 1 of nitric acid—and an insoluble chloride of silver is thus obtained, which is separated by filtering, and heated by one of the methods we have indicated: the liquor then contains chloride of gold, the metal of which is precipitated by means of sulphite of soda.

The following is a *dry method* for obtaining metallic silver from the chloride; but we may mention that, in lieu of the carbonate of lime, Spanish white, or caustic potash, may be employed:—

Dry chloride of silver	100 parts.
Carbonate of lime	70 „
Charcoal	4 „

These substances should be mixed intimately together, and put into a crucible, and heated to a strong red heat for a little more than half an hour. When thoroughly cold, the crucible may be broken, and the pure silver will be found at the bottom. There is a very simple method of extracting the silver from a single bath, which consists in the employment of metallic copper. The copper should be cleaned quite bright when immersed in the bath, and the latter should also be clear, and kept well covered during the operation. The action should be allowed to continue for twenty-four hours, and it will be found a material assistance if the vessel containing the mixture be in a warm place. The resulting precipitate, which may be removed from the copper by gentle friction with the finger, must be filtered from the blue solution (nitrate of copper), and washed once or twice with very weak ammonia water, and lastly with pure water, until a drop of the liquid as it comes from the funnel, received upon reddened litmus paper, does not restore the blue colour of it; the precipitate when dry will be pure metallic silver.

(To be continued.)

Dictionary of Photography.

BROMIDE OF AMMONIUM.—NH_4 Br. This salt may be obtained by the mixture of hydrobromic acid and liquor ammoniæ, or by the reaction of bromine upon ammonia. This latter operation should be performed in the following manner:—Pour into a flask with a long neck some pure bromine, and then cover it with water to prevent loss from volatilisation; next add caustic ammonia very gradually, drop by drop, with constant agitation, until the disengagement of gas (nitrogen) ceases, and the bromine disappears, leaving a colourless solution. Great care must be taken not to add the ammonia too rapidly, as the reaction is very violent, and the heat produced may occasion great loss to the bromine. When the reaction is completed, the liquid, evaporated to the crystallising point at a gentle heat, yields pure bromide of ammonium.

Bromide of ammonium may also be obtained in the following way:—Powder together, in a mortar, three parts by weight of bromide of potassium, and two parts of sulphate of ammonia; when intimately mixed together, introduce it into a glass retort with a very short and wide neck, connected with a large receiver; on applying a gentle heat to the mixture, double decomposition will take place, according to the following equation:—$K\,Br + NH_4\,O.\,SO_3 = KO.\,SO_3 + NH_4\,Br$. Sulphate of potassa will be left in the retort, and bromide of ammonium will sublime in the form of a white crystalline mass, which will condense in the neck and receiver. Continue the heat as long as volatile matter is given off.

It can also be obtained by adding carbonate of ammonia to bromide of calcium, filtering from the precipitated carbonate of lime, and evaporating the solution to the crystallising point.

Bromide of ammonium is a white salt crystallising in cubes; it is tolerably stable in dry air, and may easily be preserved in well-corked bottles; it does not become coloured like the corresponding iodine salt, and is preferable to bromide of potassium or calcium for photographic purposes.

BROMIDE OF CADMIUM.—Cd Br. May be readily prepared by placing bromine with six times its bulk of water in a flask, and then adding an excess of metallic cadmium in

filings; on allowing the mixture to stand for a short time, the bromine will unite with the cadmium and form a colourless solution of bromide of cadmium: this may be obtained in the crystalline form by filtering from the excess of cadmium, and evaporating the solution to dryness. Bromide of cadmium is a beautifully white crystalline salt, very stable in the air, and soluble in alcohol and ether as well as water; it is largely employed in collodion.

Bromide of Calcium.—Ca Br. May be prepared by placing in a flask bromine covered with water, and then adding gradually, pure caustic lime; this soon becomes slaked, and, if stirred from time to time, unites with the bromine very quickly: the operation must be stopped when the bromine has disappeared, but the liquid still smells of it. Then evaporate to dryness in a capsule, and heat to redness, to decompose the bromide of lime into bromide of calcium. After cooling, dissolve the residue in water, filter, and crystallise.

Bromide of calcium is deliquescent, and soluble in alcohol as well as water.

Bromide of Potassium.—K Br. This salt is composed of one equivalent of potassium, and one of bromine. It is prepared by adding bromine to solution of caustic potassa as long as the liquid remains colourless; there is thus formed a mixture of bromide of potassium and bromate of potassa, which is to be evaporated to dryness, and heated to redness in a crucible, by which means the bromate is converted into bromide with evolution of oxygen. This is then to be dissolved in water and crystallised. Bromide of potassium is very soluble in water, and crystallises therefrom in white anhydrous cubes. The commercial salt is usually quite pure enough for all photographic operations, especially if it be in large crystals. It sometimes contains carbonate of potassa, which is detected by adding, to a small quantity of a saturated solution of bromide of potassium, one drop of a solution of chloride of calcium: if no turbidity is observed, the bromide contains no carbonate; if there be a precipitate, the quantity will give some idea of the amount of impurity.

Bromide of Silver.—Ag Br. Is composed of one equivalent of bromide and one of silver, and is formed whenever metallic silver is brought into contact with bromine, either in the state of liquid or vapour; and also when a soluble salt of silver is added to a soluble bromide. Bromide of silver is of a very pale straw colour, insoluble in water and nitric acid, but soluble in ammonia, alkaline hyposulphites, and cyanides. When perfectly pure it is not very readily changed by light, but the slightest admixture of nitrate of silver renders it very sensitive to light. It is also sensitive to rays of the spectrum, which are without influence on iodide of silver. This peculiar action of light on bromide of silver has been fully discussed at p. 61.

(To be continued.)

A Catechism of Photography.

COPYING COLLODIONS.

Q. What is meant by the expression—Indirect collodion positives?

A. Images which are obtained by copying a negative in the camera.

Q. What is the chief advantage of such copies?

A. The opportunity which they offer of being enlarged or diminished in size.

Q. How is the change of size effected?

A. In the following way:—in front of the camera, at a specified distance from it, is placed the collodion negative which is to be copied. By means of a tube, or other similar contrivance, the rays of light are prevented from entering the camera except through the negative.

Q. What is the result?

A. An exact image of the collodion negative is found on the ground glass of the camera.

Q. Is the image so formed the same size as the original?

A. This entirely depends on the distance at which the negative is placed from the camera; and by altering the distance, the copy may be made either larger or smaller, at the option of the operator. If a negative portrait of a sitter be placed in the slide of the camera, and the instrument be carried into the dark room, and a hole be perforated in the window shutter so as to admit light through the negative, the luminous rays will form an image—after refraction in the lens—of the exact size of life, on a white screen placed in the original position of the sitter.

Q. What philosophical truth is learned from this?

A. That the object and the image are strictly in conjugate foci; and that, so far as the result is concerned, it is a matter of no importance from which point the rays of light proceed.

Q. How is the photographic picture obtained by this means?

A. By simply rendering the surface upon which it is thrown, sensitive to the action of light.

Q. What description of picture is produced?

A. A positive picture; that is, one in which the lights and shadows occupy their natural position.

Q. What sort of prepared surface should be used?

A. Either iodised paper or collodion.

Q. How long does the exposure occupy?

A. The time of exposure varies according to the sensibility of the surface and the intensity of the light. Experience, in this particular, is the safest guide.

POSITIVE PICTURES UPON GLASS.

Q. Can positive pictures be obtained upon glass in the camera?

A. They can; equalling in fidelity the daguerreotype, and free from the metallic glare of that process.

Q. How is the effect of a positive picture produced?

A. By backing the picture with black velvet or black varnish, which supplies all the necessary depth of shadows, and brings up the half tints and bright lights.

Q. Is ordinary collodion available for this process?

A. It is; but both in preliminary arrangements and subsequent developments some slight alterations are advisable.

Q. What suggestions can you offer as to the preparation of the collodion?

A. The following formula gives very excellent results:—

Ether	2 ounces.
Gun-cotton	4 grains.
Alcohol	1 ounce.
Iodide of potassium	4 grains.

Or the same preparation, exchanging iodide of potassium for iodide of ammonium.

Q. How should the nitrate bath be prepared?

A. In the following proportions:—

Nitrate of silver (crystallised)	80 grains.
Water	3½ ounces.
Nitric acid	2 or 3 drops.

Q. How long should be the exposition in the camera?

A. Much less than when a negative picture is desired; as the photogenic action is almost instantaneous.

Q. How is the image developed?

A. By pyrogallic acid; sulphate of protoxide of iron is frequently employed. When pyrogallic acid is used, the quantity of water commonly employed should be doubled, in order to weaken the solution. Thus:—

Pyrogallic acid	1 part.
Water	500 „
Acetic acid	20 „
Alcohol	50 „

Q. Is acetic acid preferable to citric acid?

A. It is, as it renders the whites much more brilliant; the alcohol makes the liquid flow more uniformly over the glass, and, consequently, insures a more perfect picture.

Q. How is the sulphate of protoxide of iron employed?
A. In the following solution:—

Saturated solution of iron	100 parts.
Water	600 „
Acetic acid	20 „

This solution is poured upon the glass, and allowed to remain on the surface until the picture is perfectly developed.

Q. What is done as soon as the picture is developed?

A. It is thoroughly washed in pure water, and fixed with a solution of cyanide of potassium, in the proportion of two parts to 100.

Q. Cannot these pictures be fixed with hyposulphate of soda?

A. They can, and with almost equal success; but experience has proved that pictures so fixed do not possess the same brilliancy of impression.

Q. The picture having been fixed, what is the next operation?

A. That of applying a coating of black varnish to the back. For this purpose the following is recommended:—

Essence of turpentine	100 parts.
Bitumen of Judea	20 „
White wax	4 „
Black bougie	1 or 2 „

These ingredients, having been thoroughly mixed together, are applied to the back of the glass with a badger-hair brush.

Q. Is it possible, as in the case of negative collodion, to remove the film from the glass to another substance?

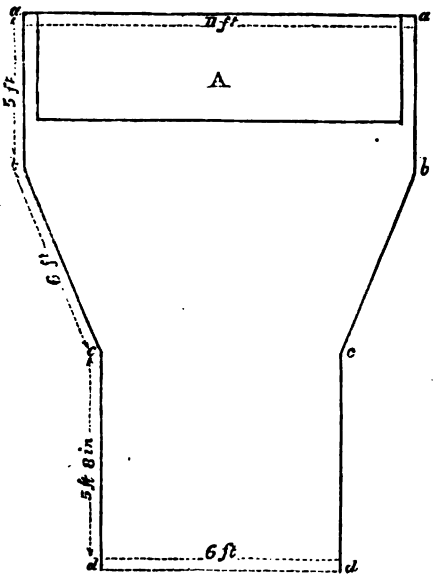
A. It is; and the results are generally very good.

(*To be continued.*)

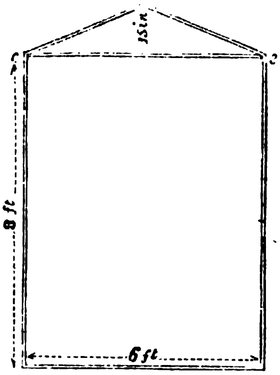
Correspondence.

A CHEAP TENT FOR TAKING PORTRAITS IN.

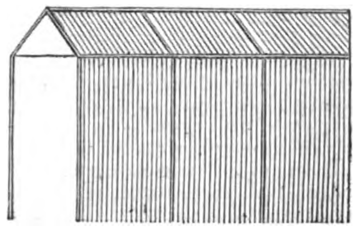
SIR,—The back is a wall, to which the framework of the tent is fixed in the same way as with a span-roofed greenhouse.



A is a raised platform, on which the sitter is placed; *a*, *b*, *c*, and *d*, are uprights of deal about two inches square, to support the slight span roof as in the accompanying sketch. The roof and one side are covered with *fine white calico*, nailed tightly on, and well brushed over with white wax dissolved in pure spirits of turpentine, and put on warm. This renders it perfectly waterproof. The other side is covered with coarse calico, rendered opaque by painting it black, but from *a* to *b* lined inside with fine white calico—to reflect a little light. The portion of the roof over the platform is rendered nearly opaque by a coat



of light blue paint. The end where the camera stands is either left open, or a curtain is drawn across it, hung with



rings upon an iron rod from *c* to *e*, according to circumstances.

H. DOUBLEDAY.

[We have seen some specimens taken in the above tent, and we must say that they are equal to anything we have seen done in the operating room. The pictures are clear, sharp, and in all respects well defined. The half-tone is perfect, and the shadows are admirably adjusted. The amateur who does not wish to incur the rather heavy expenditure of erecting a glass house, may, with all confidence, use this tent, which, from the foregoing, it will be seen can be erected at a very little cost.—ED.]

SUGGESTIONS ON THE CAUSES OF FADING.

SIR,—I have for some time past been engaged endeavouring to find the cause of so many of my valuable positive prints fading, after the most careful toning and washing: in common with many of my photographic brethren, I have been almost ashamed to own the production of my own hand after the lapse of a year or so. Thinking, at first, as most would do, it was owing to imperfect washing, I afterwards paid the most careful attention to this part of the process. Still the same evil showed itself—after a short time came visible signs of decay. The next suggestion to my mind was, that the cause might probably be old hyposulphite used in fixing the print after toning. I then carefully avoided it, by employing fresh with each print—at the same time avoiding a sulphuretted toning bath by keeping up the supply of gold, and not using it many times over; but still I am subject to the same annoyance to a considerable degree, though not so much as if I had not paid strict attention to the above. After this, another idea struck me, that the paper upon which the photograph was taken might possibly contain the elements of destruction. Accordingly I set about finding the chemical and physical composition of paper, which appears to be old rags ground up by an iron roller into a pulp, and then subjected to the action of chlorine gas, which considerably improves the colour of them; the rag or stuff is then re-ground, and subjected to another action of bleaching, by a solution of lime, chlorided or slaked,

being put in the engine, and masticated up with the pulp. It is, or ought to be, then well washed out by means of water passing through the engine; but of course it is impossible, by any ordinary means, to free it of the bleaching matter after all this grinding, as it becomes completely beaten into its very fibre, and, in that state, it is made into paper; thus the purchaser gets a sheet of paper which, if photographed upon, is sure to produce fading.

I am pleased, however, to hear that a few of our leading paper manufacturers are turning their attention to the production of paper made from new rags, thus obviating the necessity of employing any bleaching substances in manufacture. I feel confident that, when it finds its way into the photographer's studio, he may then bid fair to rival the so-much-talked-of carbon prints in point of permanence.

Again, if paper is made of such rubbish as I find on examining samples it is, we may well complain of those illtimed specks which occur in the middle of many an excellent print. We are apt to lay the blame on the state and conditions of the chemical employed, but I feel confident in saying it is in one half of the cases owing to the impurities contained in paper upon which the photograph is taken, that those spots are produced. A sheet of paper that is made from highly bleached rags, is in texture very soft and open; and on the other hand, if made of good new linen rags it will feel hard and close ground, and look very transparent by transmitted light, with an absence of those dark specks, which are atoms of iron, buttons, and other impurities. WELLINGTON.

THE SALE OF POISONS BILL.

SIR,—Although the Sale of Poisons Bill possesses features which have been long desirable as a check to their reckless sale, yet, to me, for one, it will certainly be a very great disadvantage, and doubtless there are many others similarly situated. I am engaged in chemical pursuits as a profession, and unfortunately, am not of full age; now, as the bill stands, I shall be debarred from purchasing many preparations, absolutely needful to me, simply because they happen to stand on the proscribed list. Not being a photographer myself, I should not have written to you, had I not noticed that you take a lively interest in the sister sciences.

CHEMICUS JUVENIS.

Photographic Societies.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

THE following paper, by C. HEISCH, Esq., read at a recent meeting of the above Society, has been forwarded to us for publication.

OBSERVATIONS ON THE DRY COLLODION PROCESS.

I am not about to bring forward another new process, and possibly not to say anything new; but I think one object of societies like our own is, that each member should give the others the benefit of any observations he may make while working. During the past season I have been working at dry processes, and, like most others, spoiled a good many plates before I got any good results; and it is the hope of preventing some other beginner from spoiling so many which has induced me, in the absence of any regular paper, to make a few observations this evening. Until this last season I had never tried any of the dry processes, because I had never seen any pictures on dry plates which were not hard black and white things compared with those on wet plates (I do not, under the head of dry processes, include the honey, as that is rather used as a means of preventing the plates from drying); but at the beginning of last summer, Mr. Heath showed me some pictures taken by the Rev. Mr. Cleaver, which equalled anything I had seen on wet collodion. Mr. Heath kindly procured for me the processes employed by Mr. Cleaver, which I found to be Lyte's metagelatine process, with the addition of a little honey or citric acid to the gelatine solution; but the collodion he employs contains a large proportion of bromide, and on this, I believe, the beauty of his results depends. In the last number of the *Journal*, Mr. Cleaver has published his process, which differs in one or two points from the one he originally sent to Mr. Heath. You are all aware that I advocated the use of two equivalents of iodide to one equivalent of bromide of ammonium for landscape collodion, wet or dry, and I believe the condition of things to be just about this—that you may take six views on a wet collodion, with only iodide, and, by a proper management of stops, &c. five out of the six will be very good, but the sixth will not, though, by the use of a proper proportion of bromide, it may be taken well and easily; while, on a dry collodion, if it contain only iodide, for one view that you can take you will find five that you cannot, that is, if you look for anything like delicacy of half-tone and proper effect. I now always employ the same collodion for dry plates which I before described to the Society, using nothing but iodide and bromide of ammonium. Some difference of opinion exists as to the collodion best suited for dry plates, some advocating a pyroxiline made at a high temperature, some as expressly directing a low temperature to be employed. My own experience is in favour of a pyroxiline made at as high a temperature as possible, without producing an explosion, and using plenty of it in the collodion. It is but little use giving formulæ for making pyroxiline, as many very good ones are published; but it is impossible to publish the one great requisite—experience, and every one must make up his mind to make a good deal of bad pyroxyline before he makes any uniformly good. I make my collodion as follows:—

Pyroxiline	8 grains.
Ether	5 drachms.
Alcohol	1 drachm.

IODISING SOLUTION.

Iodide of ammonium	36 grains.
Bromide of ammonium	12 grains.
Alcohol	2 ounces.

Two drachms of this solution to six of collodion. (The alcohol is distilled first from chloride of calcium, and then from potash, and the ether from potash, so that both are anhydrous and free from all products of oxidation. They should be preserved in small bottles quite full.) This makes a very strong and highly iodised collodion, and requires a bath of proportionate strength; for in collodion, as in paper, if the bath be weak in proportion to the collodion the iodide is not firm in the film. This is the case to even a greater extent when bromides are employed than with a simply iodised collodion. The bath I find work the best is made thus: dissolve 1 ounce of nitrate of silver in 3 of distilled water, and 1 grain of bromide of ammonium, previously dissolved in a little water, making the whole up to 9 ounces, by the addition of water and ½ ounce of spirit of wine, filtering, and finally adding the remaining ounce of solution of nitrate of silver. It will be observed that the iodide and bromide are added to the bath in the same relative proportion as to the collodion. I have tried using them in different proportions, but never got the bath to work so satisfactorily. It is just possible that this may be accidental, but so it is. The salts of potassium may be substituted for those of ammonium in the bath, preserving the same relative equivalent proportions. I have been led to enter into these details concerning bromised collodion, because some of my friends have been troubled with streaky plates, &c., when endeavouring to use it, and as I believe it to be the proper thing for dry plates, they are not altogether out of place here. With respect to the various substances that have been proposed for coating the plates, I do not know that, as far as the results are concerned, any one is very superior to the others.

The great points seem to be to use it as thin as possible, so as to form a coating at all, and to put it on the plate in a proper manner. I prefer the use of metagelatine because of its convenience. It will keep any time when well prepared, which renders it superior to albumen, which must be used pretty fresh, and it may be used cold, which makes it much more convenient than gelatine. What I have used was according to Lyte's formulæ, only with the addition of more spirit. It consists of 1 ounce of gelatine, 18 of water, and 2 of spirit of wine. This insures the keeping of the solution, and makes it run very limpid. The addition of citric acid I am inclined to think no improvement; it appears to have a tendency to produce that great intensity which is the great evil of dry plates. With respect to the addition of a little honey I can hardly yet make up my mind, but I think it may give increased sensibility. For washing I have used the vertical bath, as recommended by Mr. Cleaver, and I believe that it is better not to wash the plates

too much. A quart of water will wash a dozen stereoscopic plates quite well. Much has been said on the necessity of drying the plates in an oven before coating them with the collodion, to prevent blistering. I have no doubt it is a good plan for those who have conveniences for it, but if the collodion be kept for some little time after iodising, and the metagelatine be thin enough, I have not found it necessary. I have found the collodion work well after keeping a fortnight or so. The coating the plate with the metagelatine is the most important part of the process, and it is the proper management of this that enables one to dispense with so much washing. When I first began I did as is usually directed, drained the plate after washing, poured on the preservative solution and worked it backwards and forwards on the plate for some time before draining it off, and nine-tenths of my plates turned out bad. The preservative solution has of course a much higher Sp. Gr. than the film of water on the plate, and when thus mixed with it makes those whirling sort of marks which always accompany the mixing of solutions of different Sp Grs., and even if the movement of the plate be continued till all these whirls cease to be visible, the sensitive coat is often marked indelibly; moreover whatever nitrate of silver may remain in the film of water on the plate, is thus mixed with the preservative solution, which renders it necessary that the washing of the plate should be very perfect before the said solution is applied. By proceeding in the following manner I have never had a marked plate. After the plate is removed from the water bath, let it drain well with its lower edge on some blotting paper, and dry the back of the plate also with blotting paper. When well drained hold it quite horizontal (a pneumatic plate-holder is the best thing for this purpose), and pour some of the metagelatine all along on the shorter edges of the plate (about 2 drachms does for a stereoscopic plate), then tilt the plate very slightly, so as to make the solution flow in one slow, even wave to the other end of the plate, not slanting across it. The solution, being more dense than the water on the plate, forces the latter before it, and leaves only what is actually in the pores of the collodion; it is quite curious to see the quantity of water thus pumped out as it were from a plate which seemed perfectly drained. When the solution has all collected at the lower edge of the plate, tilt it slightly towards one corner and allow the excess to flow off, then pour on a second quantity of the metagelatine in precisely the same way, and at the same end of the plate as the first, and let it flow off in the same manner. This second quantity does over again for the first coating of a second plate. This plate should then be placed up on end to dry, when it is ready for use. The only other point on which I have anything to remark is the developing, and much depends on doing this sufficiently slowly. First, make a developer as follows:—

Pyrogallic acid	6	grains.
Spirit of wine	½	ounce.
Glacial acetic acid	½	drachm.
Water	5½	ounces.

After the plate has been well wetted with distilled water, pour over it a solution made by mixing ½ ounce of the above with ½ ounce of water and two drops of, or 30 grains, solution of nitrate of silver. This developes the picture very slowly, and of a feeble light brown colour, but the development may be continued till all the details are brought out in the deepest shadows. When this is the case, wash the plate and cover it with the undiluted developer with 4 drops of silver solution to the ounce; with this any degree of intensity may be obtained, but a rather feeble-looking negative prints best, as the peculiar colour of these dry negatives stops out the chemical rays very perfectly, much more so than would be supposed from their appearance. If you begin developing with a stronger solution, or one containing more silver, the high lights develop so much more rapidly than the rest of the picture, that they become quite opaque before the detail is half out. The plates are of course washed and fixed in the usual way.

ACCORDING to *La Patrie*, a youthful chemist has hit upon a method of instantly removing nitrate of silver stains from the hands; and this not only when the stains are of recent date, but where the skin has been cauterised by the action of the substance in question any length of time previously. The valuable discovery, which removes the only barrier which prevents so many young ladies, and not a few of the sterner sex, from dabbling in photography, is simply *linseed*.

Miscellaneous.

STRUCTURE OF THE LUMINOUS DISC OF THE SUN.—The extraordinary structure of the *fully luminous* disc of the sun, as seen through Sir James South's achromatic, in a drawing made by Mr. Gwilt, resembles compressed curd, or white almond soap, or a mass of asbestos fibres, lying in a *quaquaversus* direction, and compressed into a solid mass. There can be no illusion in this phenomenon; it is seen by every person with good vision; and on every part of the sun's luminous surface, or envelope, which is thus shown to be not a *flame*, but a soft, solid, or thick fluid, maintained in an incandescent state by subjacent heat, capable of being disturbed by differences of temperature, and broken up as we see it when the sun is covered with spots or openings in the luminous matter.—*North British Review.*

IT is curious to reflect that the aids to photographic development will date within the last half-century, and are but little older than photography itself. It was not until 1811 that the chemical substance called iodine, on which the foundations of all popular photography rest, was discovered at all; bromine, the only other substance equally sensitive, not till 1826. The invention of the electro process was about simultaneous with that of photography itself. Gutta percha only just preceded the substance of which collodion is made; the ether and chloroform, which are used in some methods, that of collodion. We say nothing of the optical improvements previously contrived or adapted for the purpose of the photograph; the achromatic lenses, which correct the discrepancy between the visual and chemical foci; the double lenses, which increase the force of the action; the binocular lenses, which do the work of the stereoscope; nor of the innumerable other mechanical aids which have sprung up for its use.—*Curiosities of Science.*

PHOTOGRAPHIC VALENTINES.—We know not whether the postman looks forward to the arrival of St. Valentine or not, but we do know that some thousands of young ladies and gentlemen look with the greatest amount of anxiety and pleasure to the return of the day. Every year this species of sentimentalism begins to bud about the latter end of January; and in addition to the last year's stock, there are to be seen in the shop windows some of "the newest designs." We only allude to the matter because we see that the valentine publishers have not failed to avail themselves of the aid of photography. In some of the valentines we have seen, there have been photographs of neat designs, and certainly they looked better than the tawdry red and yellow daubs which sometimes may be seen. In other cases the valentine is formed complete, and a little oval left to insert a portrait of the sender.

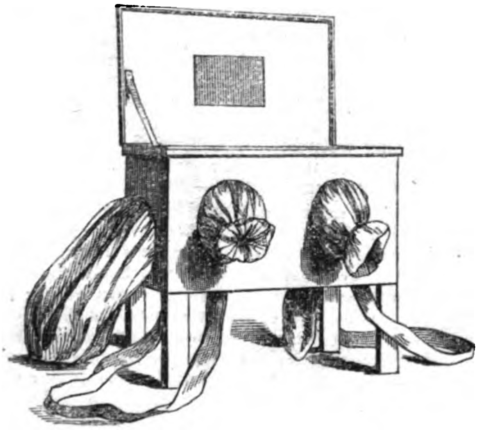
Photographic Notes and Queries.

IMPROVED DEVELOPING BOX.—COLOURING POSITIVES ON ALBUMENISED PAPER.

SIR,—Having myself derived much useful information from your paper, I beg to forward to you a stereoscopic picture of a developing box I have for some time been using for out-door stereoscopic work. I am aware that it much resembles one you have already described in vol. i. p. 179, but differs in some important respects. At first I tried to work in a box almost identical with the one alluded to, but found much inconvenience from the dark frame getting splashed during the washing processes; besides which, it was much in the way, excluding light, &c., consequently, I devised the one I now use. It has a sufficiently large hole in the left-hand side, with a black bag, lined with yellow calico, attached to it, into which I place the frame when not in use, avoiding all chances of getting it wet, and giving more space for the necessary manipulation. I also have another place in the bottom, with a similar bag fixed to it for the bath, saving the amount of room that would otherwise be required in lifting out the plate when sensitised. In front I place three thicknesses of yellow calico, and have a door to close on this for convenience of carriage. The legs are made to pull out, simply fitting tightly, so that, when packed, it is an ordinary-looking box. Its size is—length 18½ inches, breadth 10½ inches, depth 11 inches. Mine, made of

American birch, cost me 7s. 6d. for the box, and a trifle more for linings, &c. I also inclose a view, the negative of which was manipulated in the box about a week since.

I have also remarked in your paper many inquiries respecting the colouring of albumenised prints, from the



difficulty of making the water-colours adhere. The plan I follow, and believe to be the most simple, is this:—After being mounted I fill a camel-hair brush with water, and brush the print over with it until the water flows evenly, which it quickly will do. I then remove the superfluous moisture by blotting-paper, when it can be painted as easily as upon drawing-paper; when thoroughly dry, I size it over with a tolerably thick solution of gelatine, which I have never found to displace the colours, and varnish with any good varnish (I generally use copal). J. E. C.

[Judging from the specimen which our correspondent has favoured us with, we should think that the manipulations of the collodion process could be very well carried on in such a developing box as he has described. The picture is very clear, and is perfectly free from fogging.—Ed.]

SPOTS IN THE COLLODIO-ALBUMEN PROCESS.

Sir,—Now that collodio-albumen claims so much attention, I presume that anything at all calculated to remove obstacles out of the way of its practice may be of service to some of your numerous readers. Indeed, I have to acknowledge myself much indebted for many useful hints that are thrown out from time to time in the pages of your valuable periodical.

Having lately been engaged in developing some collodio-albumen stereoscopic plates, I have been much annoyed by the appearance of a number of small black specks, perfectly opaque, which gradually increase in density and somewhat in size as the development of the picture proceeds, which, of course, spoil the result; though, in other respects, the pictures are everything one could wish.

Now it occurred to me that these specks were occasioned by the presence of minute particles of iron, which had become attached to the surface of the albumen whilst the plate was in the plate-box. I accordingly examined the latter—which is a tin one—(as recommended in preference to wood for storing prepared plates), and I found, on shaking it on to a piece of white paper, that it contained a quantity of minute particles of metal, which had evidently become detached by the friction of the glass plates against the sides, some of which had attached themselves to the albumenised plates, probably, before they had been coagulated by the sensitising liquid. Here was the cause of my annoyance, and consequently a remedy was soon to be found.

Thinking that these few hints may be of use to some who, like myself, may have experienced that photography, like everything else under the sun, is "vanity and vexation of spirit" at times—I place them at your disposal.

Bene-Velis.

TONING BATHS.

A correspondent has drawn our attention to the many toning baths mentioned in different numbers of the "Photographic News," and has asked which we consider the best, on the whole, for a beginner to adopt. We cannot presume to decide, authoritatively, as to the respective merits of these baths; each has its advocates, and doubtless, with care, each would give equally good and permanent prints with the others. Our own opinion is that the one at pp. 33, 34, is the one most likely to give satisfactory results in the hands of beginners. We have, recently, been using the plan there described, and are very pleased with the results. We have found it an improvement to soak the prints in a bath composed of ¼lb. of common washing soda in a gallon of water after they are removed from the toning bath. When they have remained in the soda solution for about ten minutes, remove them to the hypo. solution. For convenience we append the synopsis of the process:—

Float paper on salting bath 1′ to 5′.
Hang up to drain.
Float on exciting bath 5′ to 10′.
Hang up to drain.
Expose in frame.
Wash in common water.
Wash in salt and water (salt 1, water 100).
Immerse in toning bath.
Immerse in soda solution.
Fix.
Wash perfectly.
Dry.

Salting bath:—	
Albumen	1 ounce.
Good common salt	30 grains.
Exciting bath:—	
Nitrate of silver	120 grains.
Water	1 ounce.
Toning bath:—	
Chloride of gold	2 grains.
Water	5 ounces.
Soda solution:—	
Washing soda	¼lb.
Water	1 gallon.
Fixing bath:—	
Hyposulphite of soda	1 ounce.
Water	8 ,,

MAJOR FITZMAURICE'S NEW LIGHT.

At pp. 56 and 142 of the "Photographic News," will be found references to the above new light; and in the *Times* a few days ago, the following paragraph appeared, which we think may be of interest.

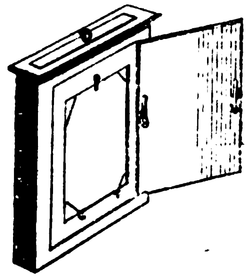
Major Fitzmaurice's New Light.—On Tuesday night (February the 15th) the Hon. Major Fitzmaurice visited the Penrhyn Slate Quarry, near Bangor, North Wales, for the purpose of exhibiting his newly-discovered light. The first experiment was conducted in a deep and long tunnel. The apparatus, which is quite portable, was placed at one end of the tunnel. The light produced from this was steady, pure, and so surprisingly brilliant, that it completely illuminated the whole length of the tunnel, and rendered a written paper distinctly legible at a distance of 300 yards. The apparatus was next brought into the open quarry. Here also the results were most extraordinary. The numerous steps of the quarry, some even at a distance of 800 and 900 yards, were as clearly seen as in daylight. Mr. Francis, the superintendent of the quarry, and a party of friends, took the most attentive interest in this wonderful discovery, and all expressed their gratification and surprise. A young Irish lady who was present exclaimed, "Why, the sun is a fool to it." This light is applicable to a variety of purposes. The colours of furniture, dresses, &c., are rendered unusually vivid, and photographs can be taken in ten seconds. It is free from injurious fumes, and consequently does not affect paint, gilding, or articles of delicate colour. It is also easily manufactured and very cheap. A light equal to that of

thirty candles can be produced at a cost of one halfpenny an hour.—*The Times.*

[Can any of our readers favour us with further particulars respecting this important invention; it is likely to prove of such value to all classes of photographers that we are anxious to possess more reliable information on the subject than has yet appeared.—ED.]

NON-REVERSIBLE PICTURES.

SIR,—To take a non-reversible portrait, the usual spring attached to the door of the dark frame must be taken out, and two silver ones affixed instead, thus (*see cut*); for the largest size the frame will take, just to touch the plate at each side; for the smaller sizes, two silver hooks at bottom of carriers, to drop the plates into, with a small silver button (*as in sketch*) at top, are sufficient—the two springs on the door keeping the carrier in its place.



Prepare the plate as usual—one free from specks; wipe back dry (first with blotting paper lightly, finishing with a piece of soft clean rag); place same in dark frame, collodion side towards the door, and not the shutter; and if the object has been focused by reversing the ground glass, or by laying a piece in the dark frame so reversed (which is more certain), the same good results will be obtained, as far as definition, as in a reversed one. M. D.

YELLOW ILLUMINATING MEDIUM FOR THE GLASS ROOM.

SIR,—If any of your numerous readers wish for a really cheap and good yellow light in their dark rooms, and if the subject is not already exhausted, I can inform them that I have, for the last three years, had no other light to work by than that admitted through a common glass window, 2 ft. × 3 ft., simply painted on the inside with a well ground mixture of orange lead, yellow ochre, and orange chrome, mixed with boiled linseed oil and a little oak varnish; with this I gave the window two or three coats, and have not since touched it with paint. It gives abundance of light in dull weather, is full south, and, in bright sunshine, I have never had a single foggy picture from any cause. I never take any precaution to shade the window, although there are numerous small pin-holes in the paint. Without the necessity of using paper or gamboge, the foregoing has answered well, and is very economical. X.

GRADUATED BACKGROUND.

SIR,—A few weeks ago, I saw a great many remarks on "backgrounds" with light centres, the following method I find suits my purpose: a frame covered with stone-coloured calico, and in the middle I have placed a small piece of wood in the shape of a star, painted light blue; from this I have a long string, which pulls through a brass ring at the top of the background. By pulling this string during the exposure of the glass, it turns the star round with some rapidity; you will find this produces a very perfect white light round the head of the sitter. This plan will apply as usefully to positive as to negative photographs. AN AMATEUR.

IMPROVEMENTS IN THE STEREOSCOPIC CAMERA.

SIR,—I see in the "PHOTOGRAPHIC NEWS," p. 275, suggestions for improving the stereoscopic camera. I have for some time past made them as there suggested; I have usually made a long table about two feet long, hinged in the middle so as to fold in half, upon which slides from end to end a swivelled board, upon which the camera is placed, and which is regulated by screws to give the proper angles. The way I use it when taking a distant view is as follows:—Supposing the operator to be standing behind the camera when placed for taking the view, he would begin by placing the camera at the right-hand end of the long table, and then taking the cap off the left-hand lens, he would next pass the camera to the left-hand end of the long table, and take the cap off the right-hand lens, when the view will be taken on the plate the same as if taken with the one-lens camera and shifting back, and would not require to be transposed as if taken with the twin lenses at the same time.

THOS. H. CROUGHTON.

27, *Greenhill's Rents, Smithfield Bars, E.C.*

To the Editor of "THE PHOTOGRAPHIC NEWS."

SIR,—I wish H. S. I., when he has finished his useful *synopses*, would give us essays on the point "What chemicals *will* tenant the same abodes in peaceful succession,"—how *few* dishes, funnels, and temporary receptacles each process *positively* requires. The same boat would hold, we know, the fox and the cabbage, though the ferryman had to return again for the goose; but young chemists are apt to be nervous. Again, short "Things that will *do*," after the manner of "What to avoid," would help photographers under difficulties, and hinder none. The Birmingham Dry Plate Co. has everlastingly obliged me by telling me that a slate-pencil would *do* to stir with.

PHOTO. BEYOND RAILWAYS.

GELATINE PAPER.

SIR,—In your "Catechism of Photography," I see "gelatine paper" mentioned as used for transferring the collodion film; would not this be liable to cause some confusion? as what I understand to be gelatine paper is gelatine made into a very thin sheet. Would not "gelatinised paper" be better where paper coated with it is intended? I see an advertisement in this number of the "PHOTOGRAPHIC NEWS" of gelatine paper, but this surely cannot be of the kind I sent you; if so, it is immensely too dear to be of any use. What I sent you was only 4½d. per sheet. It is foreign, probably French, and, no doubt, could be sold for less by taking a quantity.

THOMAS BARRETT.

MOULDED GLASS DISHES.

SIR,—In reply to your correspondent in a recent number of the "PHOTOGRAPHIC NEWS" respecting moulded glass dishes, I am glad to inform him I have succeeded in getting them made in three sizes, namely, stereoscopic, 9 × 7, and 11 × 9; that the bottoms are quite *smooth* and *flat*, and that they are quite *nonangular*, the sides springing from the bottom with a curve, and the corners being rounded, with a well-formed lip at one of them for pouring from.

JOSEPH JNO. PYNE.

63, *Piccadilly, Manchester.*

ANSWERS TO MINOR QUERIES.

STRENGTHENING OF ALCOHOL.—*J. W.* We gave the most usual method of obtaining strong alcohol in our Dictionary, vol. i. p. 210. Our correspondent asks if there is not a simpler way of increasing the strength of ordinary spirits of wine in small quantities, without going to the trouble of distilling it. Perhaps the following plan will be of use to *J. W.* Take a wide mouthed bottle, and having nearly filled it with the spirit, place a clean and moist piece of bladder over the mouth, and tie it down so that no air can get in. Bladder possesses this curious property, that whilst it will allow the vapour of water to pass through, it will keep back that of alcohol, and consequently, if the bottle be placed in a tolerably warm place, the water will gradually evaporate from the alcohol, and leave the latter correspondingly strengthened. Of course this is not a very quick process, and can only be adopted when the alcohol is required merely for *future* use. If a mark be made on the bottle to show the original height at which the spirit stood, the diminution in height of the liquid will show the amount of water lost by evaporation.

Lubricator for Brasswork, Screws, &c.—*A Mechanic* has had great difficulty in unscrewing the flange from the brass mounting of his lens, and cannot unscrew the lens at all. He inquires if we can recommend him any kind of grease or oil which can be applied to such screws without causing them to clog in a short time. We have long used the following plan, and can recommend it, not only for such purposes as the above, but for joints, taps, stopcocks, and all similar things which are intended to remain moveable and yet air tight. Take a piece of Indian rubber heat it at a temperature of about 260°, till thoroughly melted; it will now form a sticky mass, which has the valuable property of not altering or solidifying when exposed to the air. A little of this smeared on the screw, will insure its always working properly. This melted caoutchouc is a most valuable material to keep in the laboratory, as its excellent lubricating powers enables it to be applied to so many useful purposes.

The Alabastrine Process.—*Photogram.* The same causes which induce the loosening of the collodion film at times in the ordinary process, will do so in an increased degree when the picture is subjected to any bleaching agency. These causes are generally, the use of a new or contractile collodion, the use of an acid nitrate bath, the immersion of the coated plate into the nitrate bath before the film has sufficiently set, or with a thick edge formed from the drawing of the collodion, or from carelessness in washing. If all these causes are avoided, then try the remedies suggested in a former number of the "News," vol. i. p. 23. A gentleman, who has much experience in the production of alabastrine pictures, informs us that by the use of ordinary precautions, and the use of a collodion adhering tenaciously to the glass, he has not, out of many hundreds of pictures so treated, lost a single one he wished to preserve by washing off the film. He is using the advertised alabastrine solutions, and a collodion for the purpose, dignified with the name of American Excelsior Collodion.

Liver of Sulphur.—*W. L. M.* Liver of sulphur consists of tersulphide, pentasulphide, and intermediate sulphides of potassium, according to the proportions of the ingredients employed, mixed with sulphate, and often at the same time with carbonate of potassa. It is prepared by gently heating sulphur with carbonate of potassa in covered earthen or cast-iron crucibles. The common proportions are two parts of carbonate of potassa and one of sulphur—the quantity of the latter ingredient should, however, be increased a little. If a solution of this body in water be used to precipitate the silver residues as described at p. 270, our correspondent will find that sulphide of silver will be at once formed.

TO CORRESPONDENTS.

Our next Number (26) will conclude Vol. I.; and will contain, in addition to the current photographic news of the week, a very perfect and copious Index.

☞ Some complaints having been made by our subscribers as to the non-receipt of the "Photographic News," the publishers beg respectfully to notify that every care is taken on their part to insure punctual and correct dispatch. All complaints should, therefore, be made to the Post Office authorities.

We must beg our correspondents not to send glass plates through the post, except they are securely protected against breakage.

Photo. beyond Railways.—1 and 2. We have not yet fulfilled our promise, but hope to be able to do so early in the new volume. 3. We do not like a protosulphate of iron developer in the waxed paper process. Gallic acid has succeeded best in our hands. 4. Nitric acid is the best thing to clean a dish with, even when wanted for an ammonio-nitrate bath. Of course rinse the dish well in water after the acid. 5 and 6. Archer's transferring varnish, being a solution of gutta percha or benzol, will do as it is for coating paper trays. Coal naphtha is impure benzol. 7. See the editor's "Handbook to the Waxed Paper Process." 8. It is not patented; we intend giving an account of it as stated at 1.

A. Davidson.—1, 2, 3. It will be almost impossible for you to obtain satisfactory results with a combination made of such lenses as you describe. The manufacture of a portrait combination is one of the most difficult departments of practical optics, and the proper arrangement of the curvatures, &c., requires high mathematical skill. 4. Good sealing wax is not considered to have any injurious action on the nitrate bath.

H. T. (M R.C.S.)—1. Not very favourably. 2. We prefer the aplanatic. 3. It is not intended for portraiture.

G. R. (Birmingham).—We are obliged for your communication; the plan you suggest is, however, well known.

J. B . . . . . n.—1. If the alabastrine solution is properly prepared, it ought not to make the picture of a bluish colour. Prepare the solution as at page 180, or purchase some from the advertised agents. 2. A good negative should have the drapery and dark shadows as distinct in proportion to the intensity of the illumination on any other parts of the picture. 3. Perhaps the collodion had not settled, or the bath wanted filtering, either of these causes would occasion small holes over the negative. 4. We like nitric acid instead of acetic acid in the developing solution, in cases where the extra time required in the development is of no consequence.

J. B.—Many thanks for the paragraph. We will endeavour to do as you suggest; but in papers translated from the French it will not always be possible.

W. H. Fox.—The most likely cause for the appearance is, the employment of alcohol of insufficient strength.

P. S.—We cannot give you more information on the subject than will be found in the papers which appeared in our columns some time since.

Rack and Pinion.—Those combinations of lenses which are intended to be used for both portraits and landscapes (by unscrewing one lens), are not usually so good as those made expressly for one particular purpose. French lenses are not considered so good as English.

W. L. M.—Add solution of chloride of sodium until no more precipitate is formed, then make acid with nitric acid, place in a large bottle, and shake violently for some minutes; this will cause the precipitated chloride of silver to cohere together, and you will not find any difficulty in filtering it.

J. L. Davies.—We recommended the alkaline solution at p. 66 in preference to Bayard's bath; more on account of its not being likely to cause the pictures to fade, than for any other reason. If you cannot succeed well with it, try the plan recommended at pp. 33, 34, and noticed again in the present number. We can speak from experience as to the beauty and permanence of the results. We do not know how Ogle and Edge's prints are toned. They are peculiar, but not such as we should care to imitate.

W. Deane.—The picture you enclosed is very successful. 2. Try 10 grains of protosulphate of iron to the ounce. 3. We are sorry we cannot give you more information on that point than has already appeared.

Colon.—1. We do not think it will; but we have seen very good pictures done by its means. 2. Almost as well. 3. See under the head "Answers to Minor Queries" for an answer to this.

J. Askew.—1. You do not tell us the strength of the silver solution, or what it has been used for before; so we can hardly say how it can be made available for exciting albumenised paper. If it is only nitrate of silver dissolved in water, it will do at once if made of the right strength. If it is a collodion bath, evaporate it down to one-third of its bulk, add a few drops per ounce of acetic acid, and filter. 2. Always tone before fixing. 3. Separate baths should be used.

M. and S.—Send a stamped and addressed envelope, and we will give you the information you require.

K.—1. We have forwarded the desired information per post. 2. A sliding front should be used. 3. The alteration you mention has not been adopted, to our knowledge, by any manufacturer; it would, however, be an improvement. 4. We expect the promised preservative portfolio will be in London shortly. We are much obliged for your other hints and suggestions; and will consider whether they can be carried out.

Yarra Yarra.—Answered in our "Notes and Queries."

Delta.—1. Develop again after fixing the positive. 2. A transparent positive is one copied from a negative, either by superposition or in the camera; in the latter case the camera must be lengthened very considerably, or the positive will be very small in comparison to the negative. 3. We do not know how raspberry syrup is prepared; we think vinegar enters into its composition.

F. Cook.—The camera must on no account be tilted upwards, but must invariably be kept horizontal; if you cannot in this way get the upper part of a house in, raise the lens up by means of the sliding front, for the required distance, and you will find that the building will enter the field, and will not now have the appearance of falling forwards, as has been the case when you tilted the camera upwards.

E. J. L.—We have answered you by post.

An Aspirant.—1. The object glass of a telescope will not do very well, but it will answer your purpose to begin with; place the flat side nearest to the view you intend to take. 2. The calotype process. 3. The first house you have named.

G. Carpenter.—We will try and obtain the desired information.

Midnight Sun.—1. We hope to be able to give you further information soon. 2. The price of the work on colouring photographs, published at the "Photographic News" office, is 2s. 6d., or per post 2s. 8d.

A Subscriber (Cork).—1. The ordinary magic lantern will do. 2. We will see about an article such as you suggest.

D. M. C.—1. *Glacial* acetic acid is meant. 2. Nitrate of potash, and nitrate of potassa, are the same thing. 3. Add a drop of nitric acid to each ounce of developing solution. 4. Perhaps the lens will not cover the corners of your plate. Look on the ground glass and see if the corners are dark. 5. Treat your bath for fogging as recommended in previous numbers. 6. Pretty good: a better one has been given in our columns.

T. T. P. B. Warren.—Take a positive on glass, either by copying a negative in the camera, or by superposition on a dry plate.

Young Beginner.—1. See above. 2. A diaphragm is piece of a metal or card, with an aperture in the middle to place in front of the lens for the purpose of diminishing the aberration of the lens. The apertures in the card vary from ½-inch to 1 inch, or more, according to the kind of lens used.

Foskett Sanery.—The receipt for an alabastrine solution which we gave at p. 180 of the "Photographic News," will not give a blue picture but a clear white one; there must be something wrong with your solution.

G. E.—Slight chippings at the edge of your lens will not produce any prejudicial effect, unless they are sufficiently large to reflect light injuriously into the camera; in this case, they may be blackened over with black varnish.

R. J. J. Brown.—An old nitrate bath evaporated down will not give nitrate of silver in anything like a pure state; it will be very much contaminated with organic matter. For a method of recovering the silver from an old bath, see to-day's "Chemistry," p. 293.

Communications declined with thanks:—F. W. X.—A. B.—An old hand—Crow—Q. A.

The information required by the following correspondents is either such as we are unable to give, or it has appeared in recent numbers of the "Photographic News:"—January.—H. Farrant.—H. B. Y.—A Beginner—Peter—A—S. T. R.—A Stranger—Old Hypo.—Tomkins—X. Y. Z.—A Subscriber.

In Type:—A. B.—S. T.—A London Firm—J. B. R.—J. W. W.—W. W.—Chemicus—W. W.

Erratum.—Page 272, line 11, for "mechanical diversion," read, "mechanical division."

*** All editorial communications should be addressed to Mr. Crookes, care of Messrs. Cassell, Petter, and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

THE PHOTOGRAPHIC NEWS.

VOL. I., No. 26.—*March* 4, 1859.

PHOTOGRAPHS IN THE DARK.

OBSERVATIONS ON M. NIÈPCE'S DISCOVERY OF "A NEW ACTION OF LIGHT."

IN giving a description of M. Nièpce's method of obtaining photographs by means of light stored up in hermetically sealed tubes, we expressed a doubt whether light was in reality the cause of the effect described, and further consideration led us to doubt still more. It appeared to us more reasonable to attribute the phenomenon of the production of a photograph in the dark to chemical agency, but our respect for M. Nièpce's ability prevented us from stating this publicly; but, inasmuch as he has now discovered that photographs may be produced by the action of radiant heat, we think we are justified in expressing our opinion that this heat, combined it may be with a chemical reaction between the bodies in the tin tube, is the actual producing cause of the effect he has described. As a proof of this, we will detail an experiment we have recently made:—We dissolved half an ounce of crystallised tartaric acid in about two ounces of water; in this we soaked some sheets of thick English paper. When the solution was well absorbed, the sheets were taken out and hung up to dry. A common tinned iron canister, about eight inches long and three wide, with a lid, was well cleaned inside, and when the sheets of paper were nearly dry, the inside of the tube was lined twice with the paper. We now followed the directions of M. Nièpce, as given in our last number, p. 291. A little water was introduced inside the tube, so as to well moisten the paper, and the excess poured out. The tube was again closed, and heated to a temperature too high to be borne by the naked hand. It was then opened directly, and applied face downwards upon a sheet of ordinary sensitive chloride of silver paper,—a piece of a handbill having previously been laid on to serve as a negative. It was suffered to remain in that position about ten minutes. The result was precisely similar to that described in our last number but one as having been accomplished by M. Nièpce in the presence of Professor Wheatstone. The circle of the sensitive paper which was covered by the mouth of the tube became visibly blackened in those parts which were unprotected by the piece of handbill, the letters on which were impressed white on a black ground, and distinctly legible. This, therefore, proves conclusively that light has nothing whatever to do with the operation, inasmuch as the *whole* of the manipulations we have described were performed at night by the light of a small lamp. The whole of the materials employed had also been kept in darkness for some time previously.

These experiments have been tried too recently for us to venture to state more than the simple fact. We have, however, clearly shown that the experiment upon which M. Nièpce chiefly bases the theory of the preservation of light, will succeed perfectly under conditions where no light has been previously absorbed; and thus it is but natural to conclude that some of the other extraordinary results obtained by that distinguished physicist may possibly admit of a less improbable explanation than one which demands the existence of a new and almost inconceivable property in sun-light.

NEW GOLD-TONING PROCESS.

THE following is the process which Mr. Maxwell Lyte sent to the last meeting of the French Photographic Society.

. . . . . This process is equally good for every kind of paper, albumenised or simply salted. Its colouring properties are remarkable, especially when used for proofs on albumenised paper, which often fail with the ordinary processes of colouring employed.

The process is as follows:—Sensitise the paper as usual on a nitrate of silver bath, at 20 per cent., and print in the ordinary way; only, it is better to overprint it a little. Then place the proof in a dish of water in order to free it from the greater part of its nitrate; put it, afterwards, in a dish of salted water, and leave it there from five to ten minutes. The object of this bath is, to convert every trace of free nitrate that might have been left in it by the first bath into chloride. This bath is essential to prevent the decomposition of the following bath, in which the proof is to be next placed. This bath is composed as follows:—

Sesquichloride of gold	15 grains.
Phosphate of soda (the purified tribasic phosphate of commerce)	300 grains.
Distilled water	$1\frac{3}{4}$ pints.

N.B. This bath ought to be completely neutral, or, at all events, rather alkaline than acid. If it should be acid, it is a sign that the chloride of gold was not properly prepared.

As soon as placed in this bath, the tone of the proof begins to change, and passes rapidly from red to purple, violet, and black; at the same time, the solarised parts of the proof lose their dead tone, and all their details are developed in an astonishing manner.

The colouring may be arrested at any moment. If it be stopped at the purple tone, the proof will appear sepia after the operation, if stopped at the black tone, it is rather black or grey. After this bath, the proof is put in a new hyposulphite of soda bath, of 20 per cent., in which a little Spanish white has been put in suspension, and finished as usual.

These proofs are so stable that they resist the action of a cyanide of potassium bath for a very long time.

The great advantages of this process are—1. The colouring bath is perfectly neutral, and cannot produce any decomposition in the hyposulphite of soda; 2. The colour is entirely produced by the gold, which has hitherto been considered the most certain means of colouring, since the proof is not in contact with the hyposulphite until after it has received its colour. Finally, there does not exist in the bath any organic acid to determine its spontaneous decomposition, and the precipitation of the gold in a metallic state.

The colouring bath described above may be prepared beforehand, it does not decompose by keeping if care be taken that none of that used is returned to the bottle. It is likewise very economical, since with 15 grains of chloride of gold, sixty or seventy pictures, 24 × 30, may be coloured. In order to make sure that no traces of gold that may be left in the bath after use shall be lost, the remains of these baths should be poured into a bottle containing some bits of copper.

180 grains of borax may be substituted for phosphate of soda with a like result.

The proofs sent by Mr. M. Lyte, with his communication, were pronounced to be equal in brilliancy and colouring to those obtained by the process of toning with alkaline salts of gold.

Critical Notices.

The Principles and Practice of Harmonious Colouring, especially as applied to Photographs. By an Artist-Photographer. London: Cassell, Petter, and Galpin, "Photographic News" Office; and Newman, Soho-square.

Whatever may be the ultimate destiny of photography, it appears tolerably certain that, for the present at least, portraiture must claim the largest share of attention amongst professional operators. It is scarcely less certain, that in the majority of hands, and to meet the majority of tastes, colour as well as form is necessary to the production of satisfactory likenesses. Such being the case, it is somewhat singular that whilst elementary treatises on photography have issued from the press in such profusion as to produce something of an *embarras de richesse* anything like a comprehensive and intelligent work on the application of colour to photographs has not until now appeared. With the exception of a little book we noticed some time ago on "Painting Photographs," and in which the photograph is chiefly regarded as the basis of a painting, this is, we believe, the first distinct treatise on the subject.

One of the first facts which strike us on perusing the work is the absence of that misappreciation of photography which has been too common amongst painters. The author is manifestly as familiar with the mysteries of the "dark room" and the capabilities of the camera as with the palette and pencil, and very willingly regards photography as something more than a "servant of servants." Notwithstanding this, he is keenly alive to the defects, not so much of photography, but of photographers; and in an introductory chapter, which we commend to the attention of our readers, speaks with unmeasured censure of the vulgarity which has unfortunately characterised a large portion of photographic portraiture. The remedy for this, he suggests, is a higher state of artistic culture amongst photographers. On this subject the following remarks are to the point:—

"A cardinal blunder with photographers has been the supposition that a good photograph must necessarily be a perfect representation of nature, and that such an imitation of nature as the photograph presented must be the highest triumph of art. Passing by, for the present, the first assumption, or, for the moment, for argument's sake, admitting it to be true, we must submit that nature has many aspects, but not all equally beautiful. As regards portraiture, the living model is seen in ever-shifting positions, and ever-varying aspects of light and shade, very few of which, however, it may be, would be suitable for portraiture, notwithstanding that they are all natural. That a portrait should be what some call natural does not, therefore, by any means imply that it is perfect as a picture. It may be natural that a person should at some time wink, smirk, or frown, that he should occasionally stoop, loll, or stretch himself; but no one would for a moment dream of perpetuating these actions in a portrait. Notwithstanding, we have seen many photographic portraits in positions little better. Sitters placed upon a chair bolt upright, with head, body, and limbs in one line, a hand thrust forward sprawling on each knee, all arranged with such accuracy that if the figure were cleft down the middle, the halves would weigh the same to a fraction! The expression accompanying this position being generally either one of the most listless fatuity, or, with every muscle on the strain, the eyes glaring, and the features contracted to a most diabolical frown, the idea is conveyed that the sitter is just gathering his energies for a fatal spring upon some victim. Others, again, carefully avoiding these enormities in arranging the sitter, affect positions of unstudied ease and carelessness, in which, however, everything like grace or dignity is alike wanting.

"The photographer must not only give up his favourite notion that he has only to depict nature to succeed, but also that the most perfect photograph is necessarily an accurate reproduction of nature as she is seen. The best product of the camera, unaided by art, is often very far indeed from being a transcript of nature. The principles of photography, both chemical and optical, combine to render this inevitable. The intense photogenic action of some colours, and the almost entire absence of such action in others, chemically, and the necessary undue enlargement of advancing objects and diminution of retiring ones, mechanically, combine to remove the photograph as far from nature as many imagine the painting to be; the difference being, that whilst it is the province of art to soften peculiarities, photography very often exaggerates them. The incipient wrinkle or trifling scar, which in nature is, it may be, hid by the brilliancy of complexion; the slight freckle, which to the eye varies so little from the general tint of the skin as scarcely to excite observation, are at once searched out by the one huge cyclopean eye of the camera, and rendered with uncompromising distinctness in black and white. The red or golden tresses appear with raven blackness, whilst the blue eye, which in the photograph is as colourless as water, seems to have lost in depth of colour what the hair has gained. The most enthusiastic photographer has often felt his failure here, and has here acknowledged that the aid of art, in colouring, is pre-eminently needed.

"In thus referring to the defects of photographic pictures, we must not be understood to depreciate photography. We simply insist on the necessity of the artistic element in applying it. We deny entirely that photographic portraits *necessarily* represent the sitter as having just gazed on the Gorgon's head. Let the photographic operator, whilst availing himself of every improvement in manipulation, acquaint himself with the laws by which the painter secures the semblance of nature; let him learn how to arrange his subject, and choose his point of view; how to secure a proper balance of light and shade: in short, how to produce a *picture* instead of a mere diagram. Let him remember, also, that although many of his sitters may be disposed to use the words of Oliver Cromwell—'Paint me as I am, warts, and wrinkles, and all'—that no one will wish the warts to appear as wens, nor the wrinkles as seams and scars. Let him study the productions of the great masters in painting, both for position, drapery, disposition of light and shade, and colouring. A portrait secured under the best conditions of photography, guided by art, will be worthy of the best efforts of the colorist, and may, in his hands, fairly rival the finest miniature painting."

Of the practical portions of the book, an important feature is the chapter on the application of powder colours to positives on glass and paper. It is, we have no hesitation in saying, the most complete, if not the first complete, chapter of instructions on this subject ever published. Of course, we except in this remark our own "Lessons," and it may be important and interesting to our readers to know on this subject that the instructions of the writer in no wise clash with those in our columns, and that the same numbering and classification of colours appears to have been adopted as those referred to in our "Lessons," so that the student of both courses of instruction will not be led into any confusion in this respect. It is scarcely saying too much to observe that the careful study of our "Lessons" and of the work before us can leave little to be desired in this department, and, so far as knowledge can aid him, the photographer will be in a position to achieve all that can be effected by photographic colours.

The chapters on water and oil colouring, and their especial adaptation to photographs, are equally good. The remarks on the selection and preparation of photographs for the especial treatment intended will prove highly interesting and valuable to photographers, as will also the practical hints on the modes of remedying defects, varnishing, &c.

An important feature of the book is an interesting chapter on the harmony of colours, with coloured diagram illustrating the relations of the primary, secondary, and tertiary colours. The artistic portion of the book is guaranteed by the name of one of the oldest and most respectable houses connected with art and the supply of art requisites, and will, we doubt not, fully sustain their reputation. Altogether, it is a book which should be in the hands of every photographer, as it cannot be read without interest, nor studied without profit.

Lessons on Colouring Photographs.

RELATIONS AND HARMONY OF COLOURS—(*continued.*)

We shall conclude our brief statement of the principles on which harmonious colouring is based by a few remarks on their application to portraiture, following to some extent, on this part of the subject, the authority of M. Chevreul, whose work on the harmony and contrast of colours, and their application to the arts, is perhaps the most complete and conclusive ever published.

Notwithstanding the almost infinite gradation and variation of complexion amongst the Caucasian or white race, it may be, and generally is, divided into two well marked types, the blonde, or fair complexions, and the brunette, or dark complexions.

In the first type, the blonde complexions, the harmonies of analogy chiefly prevail. The colour of light hair, being essentially the result of a mixture of red, yellow, and brown, is regarded as a pale orange brown; and the colour of the skin is analogous to it in generally being a very dilute or pale tint of the same colour. The roseate tints of such complexions, although entering into another scale of colour, forms no contrast, but generally preserves the analogy of hue. The blue eyes most common in such complexions are the only points giving rise to the harmony of contrast.

In the brunette type, on the contrary, the harmonies of contrast predominate. The hair, eyebrows, eyes, &c., contrast in tone and colour "not only with the white of the skin but also with the red parts, which in this type are redder, or less rosy, than in the blonde type." This classification can of course only be regarded as existing in an absolute degree where the types are strongly marked, and is so far generally suggestive.

In regard to the effect of draperies on complexion, especially when in immediate contact, the following suggestions will be found worthy of remembrance:—Rose red cannot be put in contact with the rosiest complexions without detracting from their freshness, unless it be kept decidedly lower in tone. Dark red is in many cases less objectionable, as from its depth it tends by contrast of tone to impart whiteness.

A pure, delicate green is, on the contrary, favourable to fair complexions, especially if they are at all deficient in colouring. Where the carnations are, however, decidedly red, or are much inclined to orange, a delicate green is less suitable, whilst deep green will give them value from contrast of both tone and hue.

Yellow drapery, as is well known, is favourable to a brunette, as it tends to neutralise the yellow in the complexion. To fair complexions it is, however, often ruinous, imparting to them, as it does, something of its complementary, purple.

Violet is rarely favourable to any complexion, as no complexion is improved by receiving an accession of its complementary, yellow. It has the effect on fair complexions of imparting a sickly greenish yellow, and, on dark complexions, of making them appear affected with jaundice. The only case in which it is admissible is when, by extreme depth, it imparts whiteness by contrast of the tone.

Blue, as is well known, is suitable to most fair complexions, affording, as it does, a complementary contrast to the general hue of the complexion. The only fair complexions in which it should be avoided are those accompanied by red hair, in which case the orange tint of the hair would be augmented, an effect rarely to be desired. Blue rarely suits the brunette complexion, which is not often improved by receiving any accession of orange.

Orange drapery is rarely suitable, as it is too glaring and brilliant in itself, and no complexion is improved by looking blue—an effect which the proximity of orange is calculated to produce.

Pure white improves a fresh, rosy complexion, but to complexions wanting in freshness, whether belonging to the blonde or brunette type, it is injurious. The whites, however, of light open white draperies, such as net, tulle, lace, &c., have the effect of grey, and improve most complexions.

Black draperies will, in most cases, tend to whiten the effect of the skin, but where there is a prevalence of dark red in the complexion it is unfavourable, as the red is heightened and appears less roseate.

The application of the principles we have briefly indicated must rest with the artist, and will call for the constant exercise of careful observation, study, and judgment; for, as M. Chevreul remarks, "the varieties which exist between the two extreme types of complexion, and which unite them by insensible shades, are the reasons why the artist only can estimate the harmony most suitable to such of the varieties as he is employing for a model; consequently it is for him to judge if the dominant tint of a complexion must be exalted or diminished, either integrally, or in one of its elementary colours, or whether it must be altogether neutralised; it is for him to see, in the case where he wishes to weaken it, if this is best done by means of a drapery of a darker tone, and thus to form a harmony of contrast of scale or hue, or else, if, on the contrary, it is preferable to attain the same end by opposing to this tint a drapery of its complementary colour, taken at a sufficiently high tone to produce the double effect of weakening by contrast of tone, and at the same time of producing a contrast of colour with that portion of the tint which is not neutralised."

(*To be continued.*)

A Catechism of Photography.

ALBUMEN PROCESS.

Q. Has the albumen process been long known to photographers?

A. It has, having been used many years before the introduction of the collodion.

Q. By whom was the process invented?

A. Sir John Herschel in England, and M. Nièpce de St. Victor in France, who exhibited the first negatives obtained on glass by means of albumen.

Q. Is it a difficult process?

A. No, the plan is simple enough, but requires considerable care in manipulation.

Q. Is it a successful process?

A. Yes; it rivals the daguerreotype in sharpness of definition.

Q. Is it more or less sensitive than the collodion?

A. It is less sensitive than the collodion, requiring an exposure of minutes where the collodion demands seconds. It surpasses collodion, however, in its capability of rendering depth and transparency of shadow, with extreme brilliancy in the high lights.

Q. What is albumen?

A. White of egg. Albumen is the true starting point from which all tissues are formed, as the egg contains no other nitrogenous compound except albumen; the yolk containing, besides albumen, a yellow fat only.

Q. What is the chief characteristic of albumen?

A. Its coagulability by heat.

Q. How is soluble albumen obtained?

A. It may be obtained in a soluble form by evaporating at a temperature below 120°. It is then a dry, horny, brittle mass of a yellowish colour, tasteless, and without odour. It is insoluble in alcohol and ether, but soluble in water containing alkaline salt or chloride of sodium. It is an important fact that albumen cannot exist in the soluble state in the absence of mineral constituents, and that a slight alkaline reaction is the best condition for photographic operation.

Q. What albumen is best adapted for photographic purposes?

A. That of the hen's egg. The eggs should be perfectly fresh, and not more than four or five days old.

Q. How is the albumen to be obtained from them?

A. By breaking each egg separately into a shallow dish, and retaining the yolk and germ in the shell.

CLEANING THE GLASS.

Q. What sort of glass is the best adapted for this purpose?

A. New patent plate glass.

Q. How should the glass be cleaned?

A. By fixing it firmly in a wooden screw or vice, perfectly flat, and rubbing it with a pellet of cotton wool dipped in a solution of alcohol, ammonia, water, and tripoli.

Q. In what proportion should these ingredients be mixed?

A. As follows:—

Alcohol	1	ounce.
Strong liquid ammonia	¼	"
Water	1½	"
Tripoli	1	"

Q. How do you proceed with the cleaning process?

A. As soon as the plates have been thoroughly rubbed over with the solution, they should be allowed partially to dry, then rubbed off with a clean piece of wool, and, finally, polished with another pellet of the same material. The back and edges should be dusted with a hog's hair brush, and the plates then put away in a dry clean box.

ALBUMENISING THE GLASS.

Q. How should the albumen be prepared?

A. In the following manner:—

Albumen	12	ounces.
Saturated solution iodide of potassium ..	¼	"
Bromide of potassium	23	grains.
Water	15	"
Solution of caustic potash	1	drop.

These ingredients, having been put together in a large bottle, should be thoroughly shaken up until the bottle is quite filled with white foam. The solution should then be allowed to stand for five or six hours in a cool place. One hour before the solution is to be used, it should be decanted into a glass measure.

Q. How is it to be spread over the glass?

A. The glass should be taken on the tips of the fingers of the left hand, and the albumen poured on to the surface in a sufficient quantity to cover the plate; the excess must be poured off into the measure. It is best to prepare a number of plates at once; four dozen can easily be coated in an hour; each plate takes a considerable time to dry; and, thus albumenised, will keep for any length of time.

(*To be continued.*)

Photographic Societies.

LONDON PHOTOGRAPHIC SOCIETY.

AFTER the names of the members of the Society who had been elected at the last meeting had been read, the Secretary proceeded to read the minutes, a reference in which to the accounts having been received and adopted brought Mr. Bishop on his legs, to give formal notice of a resolution he proposed to move at the next meeting. His resolution was to the effect, that, to better enable the members of the Society to understand their financial position, a detailed statement of the accounts for 1858 should be forwarded to each member of the Society, and the same plan be continued in all subsequent years, one week previous to the annual meeting of the Society. The Chairman expressed his opinion, that no member was entitled to give such a notice except at the annual general meeting.

Mr. Bishop then urged that the President had laid it down, that it was competent to any member to give notice at any *one* meeting, that he would move a certain resolution at the *following* one.

The Chairman, having consulted a copy of the Rules, reasserted his opinion, that no such resolution as that proposed was admissible, but expressed his opinion that the council would be happy to consider the resolution he proposed, and to give him any information in their power.

Mr. Bishop placed a copy of his resolution in the hands of the Chairman, and the matter was allowed to drop.

Major Cooper was then requested by the Chairman to read a paper he had prepared on the subject of positive printing by a new process. The reader admitted that he had not had time to consider his process thoroughly, and that he had no doubt some of the members of the Society might improve it. It is not necessary that we should give a detailed report of his process, as it is by no means so new as the Major imagines. It consists in steeping good thin paper in a solution of bi-carbonate of potass (60 grains to 2 ounces of water), and then floating it on the silver bath, the result of this being the formation of a sensitive surface of carbonate of silver, instead of the ordinary one of chloride of silver. The fixing was then accomplished by means of malic acid; thus obviating the use of hyposulphite of soda, the malate of silver being dissolved away by means of distilled water.

Mr. Hardwich pointed out sundry objections to the adoption of Major Cooper's process, and supported his objections by results he had arrived at in various experiments he had made.

Mr. Shadbolt rose for the double purpose of correcting Mr. Hardwich, and enlightening Major Cooper on certain points of chemistry; of which—

Major Cooper, in his reply, showed that he was in no need.

The Secretary then read a communication from Mr. Hardwich, proposing that a committee should be selected from among the members of the Society, to examine and pronounce upon the merits of his collodion. He was prepared to give them the fullest information on the subject.

A letter from a correspondent was then read, referring to Mr. Pouncey's carbon process (which, by the way, we may mention, is asserted not to be Pouncey's at all), but it was read in so low a tone that it was impossible to hear more than a few dislocated sentences at a short distance from the table. We believe, however, that the writer said he had tried the carbon process claimed by Mr. Pouncey, and had not succeeded in obtaining good results.

A member rose and stated that he had tried it, and wholly failed.

Mr. Shadbolt rose to offer some remarks on Mr. Hardwich's proposition; the drift of which was, that the committee should examine and report on the comparative merits of all other collodions that might be submitted to their examination by other makers as well as by Mr. Hardwich.

Mr Sebastian Davis stated, that he had tried the formula given by Mr. Hardwich for manufacturing pyroxiline, and had not succeeded in obtaining a satisfactory result.

Mr. Hardwich, in reply, gave several reasons why this might happen; and then, referring to the proposition he had submitted to the council, he admitted that he had not suggested that the committee should examine any other collodion than his own, and that in doing this he had been guilty of no objectionable proceeding. He had been induced to adopt a certain formula for manufacturing that substance, from having found by experiment that it was the best that could be devised. He had received communications on the subject of collodion from India, Australia, and every other part of the British Dominions, where the greatest diversities of temperature prevailed, and he had been influenced in his experiments by these communications. He thought that, after the labour he had bestowed on these experiments during the last two years, he was perfectly entitled to make the proposition he had submitted to the council.

The Chairman stated that the council had adopted Mr. Hardwich's proposal to a certain extent. They proposed to select a committee to test the merits of that gentleman's collodion, and at the same time to test the merits of collodion produced by other manufacturers.

Mr. Hughes rose to offer some observations in support of Mr. Hardwich, and referred to the "immense accumulated mass of information" possessed by him on the subject of collodion; but his remarks appeared to be based on a misconception of what had passed.

Mr. Hardwich said he had no objection whatever to the determination arrived at by the council; but at the same time, he did not consider that there was any reason why he should have made his proposition in any other form than that he had adopted, and that he certainly had not proposed that the committee should examine and report on the comparative merits of all kinds of collodion; and expressed his apprehension that the committee would have more to do than they could successfully accomplish.

The Chairman said the council had not had time to proceed any further in the matter, but they would consider it in the interval between this and the next meeting.

He then went on to say that the exhibition would close tomorrow (Wednesday); that her Majesty and the Prince Consort visited the exhibition a few days ago, and that her Majesty had been graciously pleased to express her approbation generally of the photographs exhibited; that the Prince

Consort had suggested that the society should form a collection of all the photographs they could get, printed as far back as it was possible to obtain them, and to continue the same system for the future. He appealed to the members to contribute to carry out this idea.

A vote of thanks was then proposed by the Chairman to Major Cooper; a proposition which was received with the usual pedal demonstration, presumed to signify that the motion is carried unanimously.

The major politely bowed his acknowledgments.

The Chairman then pronounced the meeting adjourned until the first Tuesday in next month.

Blackheath Photographic Society.

At an ordinary meeting of this Society, held February 21, 1859, at the Golf Club House, the President, J. Glaisher, Esq., in the chair, the minutes of the last meeting were read and confirmed.

The President called the attention of members to the proposed *soirée*, which it was in contemplation to hold at the Mansion House, London, subject to the acquiescence and approbation of the Lord Mayor.

It was moved by Mr. Harding, and seconded by Mr. Knill, "that such *soirée* be held."

It was proposed by Mr. Wood, and seconded by Mr. Ledger, "that a Committee be appointed to promote the matter, and report progress at the next general meeting, consisting of the following gentlemen, viz.:—The President, Vice-President, Treasurer, and Secretaries *ex officio*, Messrs. Bennock and Wood."

The President then proceeded to read a letter from F. Haes, Esq., dated Sydney, relative to the deterioration of some dry collodion plates, dimness commencing at the margin and spreading about three-eighths of an inch inwards.

The President likewise exhibited some beautiful photographs of Linton and the North of Devon.

Mr. Wood, several from the south of France.

Mr. Knill, some fac-similes of frescoes from the Campo Santo, Pisa.

William Porter Knightley, Esq., was balloted for and duly elected a member of the society.

The meeting then adjourned.

Photographic Notes and Queries.

THE COLLODIO-ALBUMEN PROCESS.

Sir,—Referring to your notice of Mr. Warner's photographs in a recent number of the "News," and to the remarks at the end of your review, would Mr. Woodward, of Nottingham, favour us with information such as Mr. Warner has given, respecting his beautiful slide called "Wilford." The process, I believe, by which it was taken is the collodio-albumen, but information as to the exact manipulation, the time of exposure and development, and, above all, the kind of lens used, would be invaluable,—Mr. Woodward's slide being undoubtedly *one* of the best (if not the best) yet out in point of manipulation.

The deep shadow under the trees, so perfectly shown, proves that his lens must be first-rate. J. W. W.

THE COLLODIO-ALBUMEN PROCESS.

Sir,—In reply to your correspondent "J. W. W.," I beg to supply the following particulars respecting the stereogram "View in Wilford," which obtained the prize awarded by the Nottingham Photographic Society.

The process I use, not being a "new" one, is probably not fashionable just now; "old" processes are tabooed, and nothing goes down now if it is not a "new (?) discovery;" consequently we are inundated with these precious "discoveries," *ad nauseam*, from "raspberry jam" down to "gin-and-water," which latter, I firmly believe, would produce as good negatives, as many of these so-called *discoveries*.

My process is the old collodio-albumen, and I would refer your correspondent to an excellent paper by Mr. Sidebotham, which appeared in the "News" a few weeks since: the manipulation there described being exactly that which I practise. There is a slight difference in the preparation of the albumen, I believe; Mr. S. using iodide of potassium, whereas I use iodide of ammonium, which I believe is the more sensitive: I do not state this positively, however, having never used the potassium salt in the preparation of albumen. I speak from analogous experience in the use of the two salts in other departments of photography.

The exposure of the "View in Wilford" was two minutes, bright sun on the 13th September last, one of the last days of summer, and a more splendid "photographic" day I never witnessed.

I develop with one grain of pyrogallic to the ounce, with one drachm of *Beaufoy's* acid in hot weather, and half a drachm in cold, and use a stereoscopic lens—4½ inches focus.

I may as well add, that my experience has taught me the true secret in the production of good negatives, viz.—*development;* many a plate is spoilt in this part of the manipulation by the too free use of pyrogallic, and, *above all*, of silver. Amateurs generally (of course, beginners) are too impatient to see their picture; if it does not appear in two or three minutes, more and more silver is added, to the utter destruction of the negative. I am well content if my plate is fully developed in half or three quarters of an hour. Pictures, with bright sun, are of course developed in less time; most patience is required with those exposed in dull light.

I inclose for your inspection a stereogram "In Burghley Park," Stamford, in which you will observe the details in the deep shade are observable in a more marked degree than in the "View in Wilford;" the grass, &c., under the tree on the right of the picture, were in shade as deep as night, for the day was exceedingly dull and dark, in October last; the exposure for this was seven minutes. You will observe the great latitude of exposure the process allows (I have good negatives with twelve minutes' exposure) without injury to the high lights, which is, I think, its chief and most valuable quality.

I shall be glad to supply any of your readers with such further information as I am enabled to give.

Long Row, Nottingham. Wm. Woodward.

PORTABLE DEVELOPING BOX.

Sir,—I send you a description of a developing box. It is made with ½-inch wood; size—outside measure, 18 inches long; 13½ inches deep; 12½ inches broad. In this I can pack everything except the legs of the camera, *i.e.*, camera, glasses, dishes, chemicals, indeed, every requisite for the wet process, and in sufficient quantity to keep me working for a month. A Working Man.

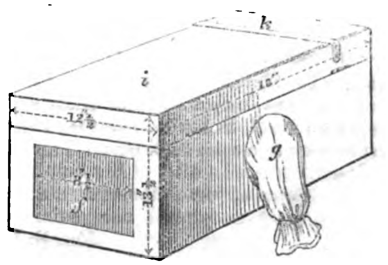


Fig. 1.

i is a shade to keep the light from the eyes: made of thin millboard, and covered with calico; the sides fold in when not in use, as in fig. 1.

k is an elastic band to keep *i* down when not in use, and to keep it steady when in use.

l is a yellow glass window, 4 × 2 inches, for looking in at; fig. 3.

a is the place for the silver bath; if required for a large size a hole might be cut out to let the bath fall into; fig. 2.

b is for the fixing bath, *c* for the developing solution, and *d* for a bottle of water; fig. 2.

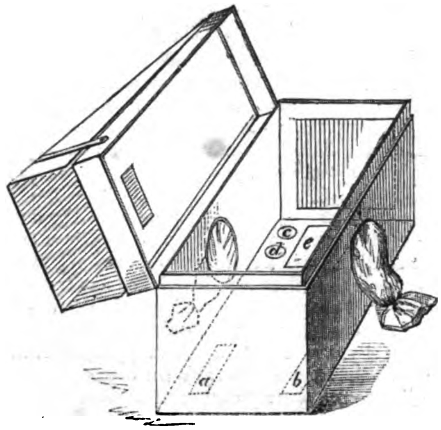


Fig. 2.

e is a dish for the waste water and developer; fig. 2.

f is a yellow glass window, 8½ × 7⅞ inches, for admitting light, with a sliding shutter to protect the glass when not in use; fig. 1.

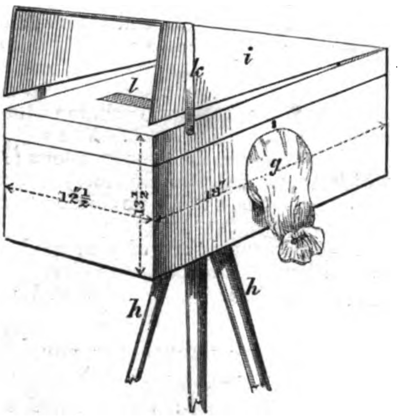


Fig. 3.

g.g are black sleeves with elastic bands; the hole is 5½ inches diameter; figs. 1 and 3.

At *h* may be any convenient stand; fig. 3.

A bottle of water may be suspended outside at one of the further corners.

PRESERVING SENSITIVE PAPERS.

Sir,—It may be of interest to some of your readers to know that they may always keep a stock of ready sensitised albumenised paper on hand, in a wide-mouthed stoppered bottle, which must be kept in a cold, dark place. The paper will then remain unaltered for weeks after it has been made sensitive.

Would you, or one of your numerous correspondents, be kind enough to give a formula for making penetrating varnish? Jos. B. Robinson.

ANSWERS TO MINOR QUERIES.

Dilute Acids.—*R. O. F. S.* When the term *dilute* is applied to acids, it is understood that the *exact* strength is immaterial. In all such cases it will be quite correct to use a mixture of 1 part strong acid and 5 parts water.

Chloride of Lime.—*K. B. B.* is astonished to see in a respectable contemporary the startling assertion, that "the substance known by the name of *chloride of lime* is simply lime impregnated mechanically with chlorine gas." This must have been written thoughtlessly, for we cannot believe that the writer has really so limited a knowledge of chemistry as to be ignorant of the chemical composition of commercial chloride of lime. It is a mixture of hypochlorite of lime Ca O. Cl O, with chloride of calcium Ca Cl. It is prepared by saturating well slaked lime with chlorine gas, and avoiding rise of temperature. The reaction of its formation may be expressed symbolically $2\ CaO + 2\ Cl = CaCl + CaO\ ClO$. It is a white, moist-looking powder, which must be preserved in well closed vessels, kept cool, and away from the light. It always smells slightly of hypochlorous acid.

TO CORRESPONDENTS.

☞ Some complaints having been made by our subscribers as to the non receipt of the "Photographic News," the publishers beg respectfully to notify that every care is taken on their part to insure punctual and correct dispatch. All complaints should, therefore, be made to the Post Office authorities.

H. Cowss B.—A toning bath is not safe to use if it deposits much black sulphide of silver, as the pictures toned in it will be liable to fade; always have your solutions clear.

Uncle Tom will observe that we only gave the "linseed" plan on the authority of *La Patrie;* we ourselves have been no more successful than our black-fingered friends.

T.—We will examine the sample of paper sent, and reserve our correspondent's letter till a future occasion.

C. Bates.—We do not at present know what the duty will be; but will inquire. The postage of each copy of the "Photographic News" to Forest City, 300 miles from San Francisco, will be 2d.

Φῶτος.—We are as anxious as our correspondent can be to hear more particulars about Major Fitz-Maurice's new light.

Alpha.—Very possibly your bath is too acid; that would be more likely than the collodion to produce the defect you name.

F. S. W.—Although at first sight the yellow colour of gold articles might make a photographer fearful of obtaining good pictures of them, it will be found in practice that there are quite sufficient actinic rays reflected along with the yellow to produce strong action.

F. Williams.—1. See answer to Φῶτος. 2. Add more silver to your bath.

C. A. Bowdler.—Try the protonitrate of iron developer, as given at p. 288. Protosulphate of iron will not give intensity in negatives.

One in the North.—1. You cannot buy the calico ready prepared with wax; but it will be very easy to prepare it yourself. 2. The proposed instrument is impossible to be made. Both eyes are necessary for the stereoscopic effect. 3. A photographic colour maker would be your best guide in this particular.

J. B. W.—The fixing solution was not properly washed off the negatives; we do not think there is now a remedy for them.

W. E. K. informs us that the form of tent suggested by Mr. Twyman is almost identical with one which he planned and had constructed some time since. Possibly this may be the case, but we cannot open our columns to barren disputes as to priority of invention in such trivial matters; priority of publication is in all cases held to decide priority of invention.

L. L. B.—We could better judge were we to see some of our correspondent's pictures

Transparent.—We do not know what is the exact point claimed by Mr. Glover in his patent for the "transparent enamel photographs." Indeed we do not see how such a thing could be the subject of a valid patent.

J. W. W.—We are obliged for the explanation, and will forward the suggestions to the person named in the letter.

R. L. Jones.—We will at once try to obtain the information required by our correspondent.

Clapham.—If your spent developing solutions are all poured into a large jug and allowed to settle, the deposit will be metallic silver.

Microphotograph.—See pages 132 and 262 for an account of what you require.

J. Rawlinson.—Thin French photographic paper.

H. S. L.—Your inclosure was received safely. 1. *All* compounds of silver present will be converted into sulphide by the liver of sulphur. 2. It will be advisable to add an excess of the liver of sulphur. Allow it to stand, draw off a little of the clear liquid, and then see if further precipitation takes place on adding more of the sulphide. 3. No; it is entirely destroyed. 4. Answered in the next number of the "Photographic News." 5. See last number, and answer to Φῶτος in the present number. 6. The price of each part of the work is only 1*s*. We will see if we can adopt your suggestions in future. There are, however, objections to such a plan.

J. Atkinson.—If some dealer in photographic chemicals and apparatus would only undertake to supply gelatine paper at a moderate price, we could point out many important uses for it. We have found it a most valuable material for removing the collodion picture from the glass plate, if a piece of it be laid, wet, on to the wet surface of the collodion picture, and then reared up to dry; the gelatine paper will easily separate from the glass, bringing with it the collodion picture, which will now be found to require no varnishing or any protection whatever, but may be used for printing from as well as if it were the original glass picture.

A Novice.—Your picture arrived completely smashed, owing to its having been insufficiently protected.

G. Tear.—A good plan was given in our last number.

Bengalee.—1 and 2. About 30 sheets, and then make fresh baths. 3. Not brushed but floated on.

Received.—D.—R. Harrington.—A Pupil of the "Photographic News."—Γ. Δ.—H. Bellini.—A. W.—W. Cochran.—H. C.—Emma.—J. A. L.—L. Smith.—A Novice.—X.—P. Q. R.—Hypo.

[Want of space compels us to defer the remainder of our answers to correspondents, together with our Dictionary and Chemistry of Photography, and correspondence till our next number.—Ed.]

⁂ All editorial communications should be addressed to Mr. Crookes, care of Messrs. Cassell, Petter, and Galpin, La Belle Sauvage Yard. Private letters for the Editor, if addressed to the office, should be marked "private."

INDEX.

N.B.—A dash rule represents the *italics* immediately preceding it.

END OF VOLUME I.

LONDON: PETTER AND GALPIN, BELLE SAUVAGE PRINTING WORKS, LUDGATE HILL, E.C.